

# **RABIES MANAGEMENT GUIDELINES**

**A compendium of rabies control measures  
and planning strategies compiled by the  
Maine Rabies Work Group – 2005.**



*~This Manual is Available in Alternative Formats~*

## Foreword

Rabies is endemic throughout the continental United States, including Maine. Although this disease is rare in humans in the U.S., it is considered fatal once symptoms develop, and requires careful consideration when a potential exposure occurs. The Rabies Work Group has worked to respond to the many issues created by rabies by updating and redistributing this manual to animal control officers, veterinarians and hospital emergency departments statewide. This manual should serve as an educational tool for use in all facets of community rabies control. Additionally, it is hoped that this manual will assist communities in standardizing rabies control practices within the State.

This revision contains updated information on rabies treatment, animal quarantine, and animal vaccination issues. In addition, in many sections, the material has been greatly expanded. Changes and updates that should be noted include the following:

- Updated contact information for consultation
- Expanded guidance on human rabies vaccination, post-exposure prophylaxis, and possible contraindications
- There is NO human rabies vaccine currently licensed for intradermal administration, and vaccine is available from only two manufacturers
- An enhanced human rabies exposure assessment algorithm
- When placed in a six-month quarantine, a dog, cat, or ferret may be immunized against rabies upon entry into quarantine, OR one month prior to release from quarantine
- Expanded guidance on bat capture and exclusion techniques
- The inclusion of the new canine rabies immunization rule, which went into effect April 11, 2005
- The inclusion of the Compendium of Animal Rabies Prevention and Control, 2005
- The inclusion of NASPHV Form 51, Animal Rabies Vaccination Certificate
- The inclusion of a Model Rabies Control Ordinance
- The inclusion of Maine animal rabies data.

This manual is an ongoing project, and updates will be posted on the Web and available for downloading at [www.maine.gov/dhhs/boh/ddc/](http://www.maine.gov/dhhs/boh/ddc/). When changes and updates are significant enough, a new edition will be published. We welcome your suggestions, and please forward any feedback to me at the following address:

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Maine DHHS – Bureau of Health  
*April 2005*

# MAINE RABIES CONTACT LIST

## **Human and animal exposure questions and rabies testing:**

Maine Bureau of Health, Division of Disease Control: 287-8773, or (800) 821-5821

TTY: 287-8016 (Deaf/Hard of Hearing)

Maine Bureau of Health, Health & Environmental Testing Laboratory: 287-2727

Maine Department of Inland Fisheries and Wildlife: 287-5252, TTY: 287-4471 (Deaf/Hard of Hearing) or call your local law enforcement agency or state police to contact a game warden in your area.

## **Domestic animal and livestock questions:**

Maine Department of Agriculture (State Veterinarian's Office): 287-3701

## **Bat control questions:**

Maine Department of Agriculture, Pesticides Control Board: 287-2731

## **Sick/suspect rabid animal with NO animal/human contact:**

USDA, APHIS, Wildlife Services: (207) 622-8263

<http://www.aphis.usda.gov/ws/rabies>

### **State Police (nights & weekends)**

Houlton (800) 924-2261

Orono (800) 432-7381

Gray (800) 482-0730

Augusta (800) 452-4664

*TDD/TTY line (Statewide) (888) 524-7900*

### **Warden Service (weekdays)**

Division A (Gray) (207) 657-2345

Division B (Sidney) (207) 547-5300

Division C (Bangor) (207) 941-4440

Division D (Greenville) (207) 695-3756

Division E (Ashland) (207) 435-3231

*To reach a Warden after hours, call the  
State Police station for your area*

**Local animal control officer and your town's animal shelter:** Your local animal control officer and animal shelter can be reached by calling the town office or city hall, local law enforcement agency, or by calling the Department of Agriculture at 287-3846.

**Oral Rabies Vaccination Program:** USDA, APHIS, Wildlife Services (see above)

**Maine Federation of Humane Societies:** Call the Department of Agriculture (287-3846) to obtain the current President's name and phone number.

**Educational materials (fact sheets and posters):** DHHS-Maine Bureau of Health, Division of Disease Control, , Station 11, Key Plaza 8th Floor., Augusta, Maine 04333, or phone 287-8773.

## DEFINITIONS

**Animal Control:** Control of dogs, cats, and domesticated or undomesticated animals in accordance with 7 MRSA section 3948.

**Animal Control Officer (ACO):** An Animal Control Officer or person acting in that capacity that is appointed periodically by municipal officers pursuant to 7 MRSA Chapter 725.

**Animal Damage Control Cooperator (ADC):** Also referred to as an ADC agent, a cooperating trapper or hunter certified by the Department of Inland Fisheries & Wildlife and operating as an agent of that Department for purposes of animal damage control.

**Currently vaccinated:** Domesticated animals are considered currently **vaccinated for rabies if at least 30 days has elapsed since the initial vaccination** and the duration of vaccination has not exceeded the time period recommended for that species and type of vaccine. NOTE: Any person who can legally obtain rabies vaccine may vaccinate their own animals, however vaccination by any person other than a veterinarian shall not be considered currently vaccinated. (For cats and dogs, Maine law requires a current Certificate of Vaccination issued by licensed veterinarians; an out-of-state Certificate of Vaccination issued by a licensed veterinarian in that state is acceptable if it is consistent with the requirements of the National Association of State Public Health Veterinarians.)

**Decapitate:** To remove an animal's head using methods recommended by the Department of Human Services. In the context of rabies control, decapitation of a domesticated animal is to be performed by a veterinarian or, in the case of an undomesticated animal, a veterinarian, game warden, animal damage control agent (ADC) or other trained person as per Inland Fisheries & Wildlife internal memorandum.

**Endemic:** The consistent presence of a disease or infectious agent in a human population within a given geographic area; the level of that disease normally expected in the human population.

**Enzootic:** The consistent presence of a disease or infectious agent in an animal population within a given geographic area; the level of that disease normally expected in the animal population; analogous to endemic.

**Epidemic:** The occurrence of a disease clearly in excess of the expected or endemic level in the human population.

**Epizootic:** The occurrence of a disease clearly in excess of the expected or endemic level in the animal population; analogous to epidemic.

**Euthanize:** The humane killing of an animal generally performed by a veterinarian, or personnel at an animal control facility under the indirect supervision of a veterinarian.

**Exposure:** Rabies is most commonly transmitted via a bite from a rabid animal, or from contact between infective saliva and the non-intact skin or mucous membranes of a human or

animal. Contact with blood, urine, feces, or milk from an animal does NOT constitute an exposure; none of these substances has been shown to contain the rabies virus. Similarly, just being in the vicinity of a rabid animal or touching the fur is not an exposure. A scratch from a claw alone is not considered a potential exposure to rabies. The two categories of exposure are:

1. **Bite:** Any penetration of the skin by an animal's teeth. Bites, in general, are high-risk exposures. Bites to the face and hands, and/or multiple bites, carry the highest risk.
2. **Non-bite exposure:** Scratches, abrasions, open wounds or mucous membranes contaminated with saliva or neural tissue from a rabid animal constitute non-bite exposures. If the material containing the virus is dry the virus can be considered noninfectious.

**Home quarantine:** The confinement and observation of an animal allowed at the animal owner's property for a specified time period, where, depending on the species, one of the following acceptable methods of confinement for are used: (a) complete indoor housing, (b) caging or kenneling in an enclosure with a securely latched door, or (c) yard confinement with perimeter fencing that the animal is unable to climb over or dig under. Acceptable methods of confinement for a cat or ferret are: (a) complete indoor housing, or (b) caging in an enclosure that prevents escape. The animal's needs for ambient temperature control, water, nutrition, elimination, and space to comfortably stand up and lie down must be adequately provided by the selected confinement method. Should the animal exhibit neurologic signs, die, or disappear during the specified period, a licensed veterinarian and the Bureau of Health shall be notified immediately.

**Incubation period:** The time interval between initial contact with an infectious agent (exposure) and the first appearance of signs or symptoms associated with the disease.

**Livestock:** Horses, cows, sheep, goats, swine, domesticated deer or any other agricultural mammal.

**Mammal:** The group of animals with hair or fur, bear live young, nurse their young, etc.

**Observation:** Term used to describe the period of time (45 days) that a vaccinated domesticated animal is to be observed for signs of rabies after having been exposed to a suspected rabid animal.

**Owned animal:** Domesticated animals, as well as animals in petting zoos and circuses that have a known owner.

**Post-exposure prophylaxis:** Rabies immunization treatment after exposure to rabies, recommended to prevent the disease.

**Pre-exposure prophylaxis:** Rabies immunization treatment before exposure to rabies, recommended for individuals that come in frequent contact with animals.

**Prophylaxis:** The prevention of or protective treatment for disease, such as rabies immune globulin and rabies vaccine to prevent an exposed person from contracting rabies.

**Provoked attack:** An attack is considered “provoked” if a domesticated animal is placed in a situation such that an expected reaction would be to bite or attack. This would include, but not be limited to, invasion of an animal’s territory, attempting to pet or handle an unfamiliar animal, startling an animal, running or bicycling past an animal, assisting an injured or sick animal, trying to capture an animal or removing food, water, or other objects in the animal’s possession.

**Quarantine:** Term used to describe the period of time that a domesticated animal is to remain separate and apart from other animals and humans after having bitten or otherwise exposed another domesticated animal or human, or having been itself exposed to rabies.

**Rabies:** Rabies is a viral disease of the central nervous system (brain and spinal cord) caused by the rhabdovirus of the genus Lyssavirus, which infects mammals.

**Stray animal:** A domesticated animal having no known owner.

**Susceptibility to rabies:** The likelihood of contracting the disease after exposure; it varies by species of animal.

**Suspect rabid animal:**

1. any mammal domesticated or undomesticated, showing signs of rabies;
2. any undomesticated mammal which has potentially exposed, through bite or non-bite exposure, a human or domesticated animal to rabies; or
3. any domesticated mammal which has bitten a human or domesticated animal.

**Unprovoked attack:** An “unprovoked” attack or bite occurs when an animal strikes for no apparent reason. The behavior should be unusual for the particular animal. A confirmation of chronic aggressive behavior can often be made by interviewing the animal’s owner. This will assist in determining whether the attack was indeed “unprovoked.”

**Wildlife Hybrid:** Any mammal which is the offspring of the reproduction between any species of wild canid or hybrid wild canid and a domestic dog or hybrid wild canid, or is represented by its owner to be a wolf hybrid, coyote hybrid, coy dog or any other kind of wild canid hybrid.



## **ABBREVIATIONS**

ACIP	Immunization Practices Advisory Committee
ACO	Animal Control Officer
ADC	Animal Damage Control
MEAgri	Maine Department of Agriculture, Animal Health and Industry
CDC	Centers for Disease Control and Prevention
DFA	Direct Fluorescent Antibody
HDCV	Human Diploid Cell Vaccine
HETL	Health & Environmental Testing Laboratory
HRIG	Human Rabies Immune Globulin
DHS	Department of Human Services
IF&W	Maine Department of Inland Fisheries & Wildlife
MRSA	Maine Revised Statutes Annotated
PCEC	Purified Chick Egg Cell Vaccine
PEP	Post-exposure Prophylaxis

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# INTRODUCTION

Rabies as a disease was described and recorded by Democritus as early as 500 B.C. The rabies virus is a lyssavirus in the genus Rhabdovirus. “Lyssa” is the Greek word for madness, and for most of antiquity, rabies has been associated with “mad dogs” and the potential encephalopathy that could ensue in a person if bitten by a rabid dog.

Globally, rabies is considered the tenth most common cause of death: it kills an estimated 30,000 to 70,000 humans worldwide every year, and 100 million people are treated with rabies post-exposure prophylaxis. In developing countries, rabies is transmitted to humans primarily by domesticated dogs and cats.

Although it still remains a zoonotic threat in the United States today, rabies in domesticated animals and humans has fallen to a very low level; from 1990 to 2005, there was an average of 3 human cases of rabies reported annually in the U.S. compared to an average of 22 cases in 1950. This is due to widespread vaccination of domesticated animals, animal control efforts to reduce stray animal numbers, and effective post-exposure prophylaxis for humans. Pet vaccination programs have had a tremendous impact on human rabies in the United States; begun in the 1940s and 1950s, these programs have reduced the number U.S. dog rabies cases from thousands every year to a few hundred per year. In 1938, there were 8,452 canine and 47 human rabies cases in the U.S., and in 1946, there were 8,384 canine and 33 human cases, while in 1994, there were only 153 canine and 6 human rabies cases in the U.S.

Wildlife is the major reservoir of rabies in the United States. Confirmed cases of rabies in animals in this country have been increasing over the last decade. There are 7,000-9,000 cases of animal rabies every year in the U.S., with 90% or more of these occurring in wildlife. Rabies became established in raccoons in the Mid-Atlantic States in 1977, then migrated slowly north and east until 1994, when it moved into Maine. In addition, a strain of rabies affecting foxes has been identified in Maine since 1994. Bat rabies is enzootic in all contiguous 48 states including Maine.

There have been six known cases where a human recovered from rabies infection. Five of these recoveries were either previously vaccinated against rabies or received some form of post-exposure prophylaxis before the onset of symptoms, and only one recovered without neurologic sequelae. There has been one recent, December 2004, rabies survivor in the U.S., and she was neither previously vaccinated against rabies nor treated with rabies post-exposure prophylaxis. Not one of these cases should be used to minimize the lethality of human rabies or the importance of rabies prevention.

The purpose of this manual and the rules for rabies management promulgated by Maine’s Department of Human Services, the Department of Agriculture-Animal Health and Industry and the Department of Inland Fisheries and Wildlife are to assist persons charged with the control and prevention of rabies in Maine and health care professionals with human exposure assessment and prophylaxis by:

- a. provide information on rabies as a disease;
- b. outline prevention and treatment of rabies exposure in humans, domesticated

- animals and wildlife; and
- c. help municipalities and animal care facilities develop their own rabies response plans.

This manual is a compilation of materials based on the most recent edition of the Advisory Committee on Immunization Practices (ACIP) for Human Rabies Prevention—United States, the Compendium of Animal Rabies Control published annually by the National Association of State Public Health Veterinarians, and other peer-reviewed publications. All portions of this manual and other information pertaining to rabies are also available from our web site at [www.maine.gov/dhhs/etl/rabies/rabies.htm](http://www.maine.gov/dhhs/etl/rabies/rabies.htm).

In Maine, the primary responsibility for the prevention of rabies lies with the Department of Human Services. However, since rabies generally begins in the wild animal population, moves to the domesticated animal population and then to humans, various state and federal agencies participated in the Rabies Work Group and assisted in the preparation of this manual. These include the Department of Agriculture-Animal Health and Industry, the Department of Inland Fisheries and Wildlife, the Department of Conservation, the Maine State Police, and the United States Department of Agriculture-Animal and Plant Health Inspection Service; private organizations including the Maine Municipal Association, Maine Veterinary Medical Association, Maine Federation of Humane Societies, Maine State Association of Veterinary Technicians, Maine Animal Control Officers Association, and the University of Maine Cooperative Extension.

# BIOLOGY OF RABIES

This section deals explains the biology of the rabies virus and the epidemiology of rabies. A thorough knowledge of the epidemiology of rabies, the characteristics of the virus and the manifestation of clinical signs is essential in formulating any rational approach aimed at managing a rabies crisis.

## Rabies Virus

The rabies virus is an RNA virus and a rhabdovirus of the genus Lyssavirus. A lipoprotein envelope surrounds the helical-shaped core of the virion. Spike-like projections of G protein are imbedded into the lipid envelope. Monoclonal antibody typing and PCR techniques can differentiate between different strains of the virus associated with different animal reservoirs and geographical regions. The rabies virus is immediately inactivated when dried and does not survive for any appreciable time in the environment.

## Transmission

The most likely mode of transmission of rabies is by introduction of saliva containing rabies virus into a bite wound. Rabies transmission can also occur if saliva or central nervous system tissue from a rabid animal contacts a fresh wound or mucous membrane lining (eyes, nose, mouth, genitalia). In the past, aerosol transmission of rabies is thought to have occurred under unusual circumstances in bat caves or laboratories where high concentrations of aerosolized virus were present in a confined area. A small number of human infections have also resulted from corneal and organ transplants, both in the U.S. and internationally.

### What is an exposure?

1. A visible bite or significant scratch penetrating the skin from a confirmed, suspected, or potentially rabid animal,
2. A non-bite exposure is direct contact of a wound (one that has been bleeding within the previous 24 hours) or mucous membrane with potentially infectious material such as saliva or central nervous system tissue (i.e. brain or spinal cord) from a confirmed, suspected or potentially rabid animal,
3. Eating of any part of a confirmed or suspected rabid animal,
4. Physical contact with a bat where a bite cannot be positively ruled out is considered an exposure, as are certain situations where a bat is discovered in the presence of a person who cannot positively determine or communicate that a bite occurred (the person was sleeping, a child, or debilitated for example).
5. Aerosolized rabies virus is thought to have caused disease and is considered exposure in rare circumstances (i.e., in a research lab or possibly a bat cave).

## Pathogenesis

When rabies virus has been introduced into a wound or onto a mucous membrane, it first multiplies at the site of inoculation. The virus must then gain access to the peripheral nervous system to migrate and ascend to the central nervous system and brain.

## Susceptibility

All mammals are capable of being infected with rabies, but there are varying degrees of

susceptibility between different types of mammals. For example, foxes, coyotes, wolves, skunks, bats, cats, and cattle are considered highly susceptible to rabies. However, some animals are very resistant to infection with the virus, and these animals are considered at low risk for rabies virus infection. Although opossums can contract rabies, laboratory research has demonstrated the dose of rabies virus required to cause disease in these animals is 50,000 times that needed to infect a fox. The incidence of clinical rabies among rodents (except woodchucks) and rabbits is extremely rare, due to these animals' decreased chance of surviving an attack by a rabid animal, but has occurred.

Cats are more commonly involved in exposures than dogs because cats interact more with wildlife, and cat control and rabies immunization regulations are more difficult to enforce, if not entirely different. According to the Centers for Disease Control, inconsistent use of vaccination in cats over the past years has been responsible for an increased incidence of feline rabies in recent years. The frequency of human rabies exposures attributable to cats is increasing at a greater rate than those associated with dogs. Some reports state that rabid cats are more likely than dogs to stalk and attack humans and other animals.

Humans are relatively resistant to clinical disease. The risk of developing rabies following the bite by a proven rabid dog is estimated to be about 15% without post-exposure treatment.

### **Incubation Period**

The incubation period is the time interval between exposure to the virus and onset of the first clinical signs/symptoms of disease. The length of the incubation period is determined by several factors including viral strain, dose of virus, site of virus inoculation (bite), age of animal, and many other host factors. The spread of the virus in the central nervous system is relatively rapid (48 to 120 hours).

#### Typical Range of Rabies Incubation Period by Species

Cats	3-8 weeks (2 weeks to 6 weeks)
Dogs	3-8 weeks (2 weeks to 6 months)
Ferrets	3-10 weeks
Cattle	2-12 weeks
Horses	3-8 weeks
Skunks	5-20 weeks
Humans	3-8 weeks (9 days to 7 years)

The incubation period for rabies in wild animals is unknown and extremely variable. Animals can acquire the virus not only through bites from a rabid animal, but also transplacentally (before birth), transmammary (the mother's milk), and/or from eating a dead rabid animal. Once a wild animal gets rabies, it may incubate the disease for a long time without showing signs and may even shed the virus without ever becoming ill. Because of this, wild animals cannot be considered to be free of rabies even if purchased from a pet shop, acquired as a baby, or held for a long period of time.

## **Signs/Symptoms of Rabies**

When a susceptible animal is exposed to rabies, the virus travels up peripheral nerves to the spinal cord (this may take 9 days to 1 year), then spreads throughout the spinal cord and brain (2-6 days), and then spreads from the brain to other tissues, including the salivary glands.

Clinical signs appear when the rabies virus reaches the brain, usually 15-25 days after exposure but sometimes taking as long as one year. This is the reason for the long quarantine period for animals bitten by an unknown attacker.

Rabies infection has classically been divided into three major stages: prodromal, furious, and paralytic. Classical descriptions may be misleading however, as rabies can be quite variable in its presentation. Not all animals pass through all of the clinical stages and the animals may vacillate between stages.

### **Major stages of rabies:**

#### **1. Prodromal Stage:**

- may last 2-3 days
- subtle temperament changes
- mild fever
- self mutilation at bite site
- slow blink reflexes

#### **2. Furious Stage:**

- animal increasingly restless and irritable
- visual and auditory stimuli may trigger episodes of aggression and vocalizing
- may roam long distances
- may attack inanimate objects and eat odd substances
- later muscular incoordination, disorientation, generalized (grand mal) seizures

NOTE: Cats especially tend to show furious signs and aggression is common.

#### **3. Paralytic Stage:**

- usually appears 2-4 days after onset of clinical signs
- laryngeal/pharyngeal paralysis leads to drooling, changes in vocalization, and difficulty eating, drinking, and breathing
- final stage includes coma and respiratory paralysis leading to death
- the longest recorded survival time in the paralytic stage was 7 days (average duration of clinical signs is 3-5 days)

In human beings, the early signs of rabies are often headache, fever, malaise, and apprehension. Numbness or sensory irritation is often experienced at the site of inoculation. Excitability and aerophobia are also frequent symptoms. The disease then progresses to paresis or paralysis, delirium, seizures, and coma. Death is generally the result of respiratory paralysis. Once symptoms of rabies appear, there is no effective treatment or cure.



### **Infectious Period (Period of Communicability)**

The infectious period is NOT the same as the incubation period. The infectious period is the period during which a rabid animal is shedding virus in its saliva and is capable of transmitting rabies to another animal or person. Rabies virus must have reached the brain before it can be excreted in the saliva; thus most rabid animals are infectious just a few days before the onset of noticeable symptoms and during the course of the disease. In dogs, cats, and ferrets, communicability is usually 3-7 days before the onset of symptoms (rarely over 4 days) and until the death of the animal – this is the basis for the 10-day quarantine for these animals. In studies with skunks, some skunks shed virus up to 18 days prior to observable signs; there is also research demonstrating that skunks, and some other species, may be able to survive a rabies infection.

Although humans or animals that have just come into contact with a potentially rabid animal are at risk for rabies, they are not themselves immediately contagious to others.

### **Rabies Virus in the Environment**

The ability of rabies virus to survive depends on the surrounding environment. Normally, rabies virus cannot live long in a warm, putrefied environment, and survives in the body less than 24 hours after death. A few minutes in direct sunlight will inactivate rabies virus. **However, under cool conditions (as in refrigeration) it may live for many days, and if the virus is frozen at -70°C, it can live for years.** Rabies virus is no longer active in dried saliva and is killed by bleach, ethyl alcohol, soap, detergent, and quaternary ammonium compounds.

### **Diagnosis**

Rabies infection is often suspected because of neurological signs that are present in an animal. However, due to the atypical nature of the disease, rabies should be considered in any animal that suddenly develops profound behavioral changes, or features of limb paralysis, or both.

If a potential rabies exposure occurs, the Direct Fluorescent Antibody (DFA) test is the only acceptable method of determining that the suspect animal does NOT have rabies; the ten-day quarantine only determines if an animal was shedding virus at the time of the exposure. The DFA test is a rapid, sensitive, and reproducible laboratory method for detecting rabies antigen in tissue. Fresh brain tissue is required. Tissue should be stored under refrigeration and should be maintained on wet ice for transport to the laboratory. (See section on rabies testing in this manual.)

It is not necessary that animals show neurological signs at the time of examination, and all animals excreting virus in their saliva should have virus in the brain detectable by DFA examination.

## ANIMAL DISEASES THAT RESEMBLE RABIES

There are many diseases and conditions found in both wildlife and domesticated species that clinically resemble rabies, including canine distemper, toxoplasmosis, larva migrans, lead poisoning, antifreeze poisoning, herpesvirus infection, listeriosis, eastern and western equine encephalomyelitis, and bovine spongiform encephalitis.

**Canine Distemper** – caused by a virus antigenically similar to human measles. Species that can be affected by this virus include dogs, raccoons, coyotes, foxes, skunks, mink, and ferrets. While distemper virus can affect nearly every body system, infected animals often display neurologic signs that can easily be confused with rabies. These signs include abnormal behavior, aggressiveness, disorientation, twitching, convulsions, and paralysis. Additionally, there may be discharge from eyes and nose, excessive thickening of skin, nose and footpads, with formation of so-called “hard pad disease.” Canine distemper does not pose a threat to public health, but is a serious disease of unimmunized dogs and susceptible wildlife and zoo animals.

**Visceral Larva Migrans (VLM)** – caused by the aberrant migration of nematode (roundworm) larvae in unnatural, coincidental hosts. The larval migration results in cyst/granuloma formation in the brain, eye, and other internal organs. Transmission is by ingestion of fecal material containing various nematode larvae. Feces of raccoons, dogs, and cats with roundworms may produce larva migrans in humans, chickens, groundhogs, rabbits, and several rodent species. Groundhogs and rabbits occupying vacant carnivorous animal burrows from raccoons, skunks, and foxes may ingest infected eggs or larvae. The larval migration to the brain and eye may result in nervous disorders such as circling, head tilt, blindness or paralysis. The lesions in the nervous tissue may render the affected animal easy prey.

**Toxoplasmosis** – caused by the protozoan parasite *Toxoplasma gondii*, that can infect most mammals and cause lesions in the heart, lung, liver, and brain. Although a serious disease of young animals, it is usually nonfatal in adults. It does not appear to be highly contagious, and is most often contracted by eating the infective stage of *T. gondii* (bradyzoite or cystozoite) in raw meat. Toxoplasmosis is common in many species of herbivorous and carnivorous wildlife. The clinical symptoms may resemble rabies or distemper. Most infected cats do not show clinical signs of the disease but may pass the infected form (oocysts) of the parasite in their feces. This may be a danger to humans and animals if the parasite is ingested through improper handling of cat litter or soil contaminated with feces.

**Toxin ingestion** – Several elements and chemicals may produce toxicological symptoms mimicking rabies. Lead poisoning is not infrequent in dogs and raccoons, and it can produce marked neurologic signs such as tremors, convulsions and blindness. Lead also has a toxic effect on red cells and hemoglobin production, resulting in anemia. Intoxication most commonly occurs from ingestion of old paints, lead plates from storage batteries, and mechanical lubricants. Mercury poisoning is primarily a disease of fish-eating carnivores such as mink, otter and cats, but can also occur in domesticated pigs from eating mercury-treated seed grains. The target organ is nervous tissue. The clinical signs of mercury poisoning are changes in posture reflexes, ataxia, blindness and paresis. Intoxication commonly results from ingestion of

mercury-containing fungicides. Ethylene glycol (antifreeze) poisoning usually occurs from pets or raccoons drinking spilled or drained antifreeze from vehicles. The sweet taste of antifreeze attracts animals and ingestion causes neurologic signs, kidney failure, and death. Organophosphate poisoning and intoxications by other pesticides often produce CNS signs, as can toxicoses with strychnine, chlorinated hydrocarbons, some toxic plants, and even natural toxins in toads and lizards. Rabies should, however, always be included in the differential diagnosis of suspected CNS toxicoses if the animal roams outdoors and is unvaccinated.

**Listeriosis** – The bacteria *Listeria monocytogenes* is an important cause of human foodborne illness in the United States. Usually a non-contagious disease of farm animals (primarily ruminants), listeriosis may infect other mammals, including humans and the red fox. Decaying vegetable matter, particularly silage, may serve as a source of infection. Signs are consistent with other kinds of meningitis or encephalitic diseases, particularly circling, head tilt, stupor, and paresis. Neurologic symptoms in farm animals are usually unilateral. Listeriosis is not readily transmitted.

**Herpesvirus infections** – Species-specific herpesvirus occur in many species of domesticated and wild animals. They may cause fatal illness in very young animals. Humans have a herpesvirus infection that causes cold sores in adults and occasionally viral encephalitis in the newborn.

**Arboviral Encephalitides** – Most arboviral encephalitis infections of man and mammals can be expected to present clinically as a suspected rabies case. Eastern equine encephalitis (EEE) is being diagnosed more commonly in pets and exotic species. Several dogs and swine were found with the disease in recent years in the southeastern U.S. This fatal disease of horses, often referred to as “Sleeping Sickness”, is extremely difficult to differentiate clinically from rabies. Other arthropod-borne encephalitis infections may also mimic rabies.

**Neuropathies of Uncertain Etiology** – Several other conditions can mimic rabies and alarm pet owners. No specific etiologic agent or cause has been identified for Feline Vestibular Syndrome, which presents as a subacute syndrome in which cats become ataxic, incoordinated, wobbly, and exhibit nystagmus. A dog afflicted with Idiopathic Trigeminal Neuropathy cannot close its jaws, and drools similar to a rabid animal with pharyngeal paralysis. Bovine Spongiform Encephalopathy (“Mad Cow Disease”), Transmissible Mink Encephalopathy, and Chronic Wasting Disease of deer and elk are all present in this country, and they are high on the differential list for rabies suspects in enzootic areas.

**Localized Lesions and Obstructions** – Viral and mycotic infections of the mouth, and foreign objects (bones, sticks, fish hooks) lodged in the mouth or throat generally cause an animal to salivate excessively causing a suspicion of rabies. As a precaution, gloves should be worn when examining such animals, especially when trying to look into or open an animal’s mouth.

**Other** - Localized cancerous tumors affecting the central nervous system can also produce a variety of neurologic signs, as does hepatic and renal failure due to the accumulation of metabolic toxins.

# **MUNICIPALITIES' RESPONSIBILITY TO RABIES CONTROL**

## **RABIES CONTROL AND PREVENTION PROGRAMS**

The goals of rabies control and prevention programs are to 1) prevent human cases of rabies, 2) prevent human exposure to actual or potential rabies situations, thereby averting the need for and expense of human post-exposure treatment, and 3) to prevent rabies in domesticated animals.

### **Response Plan**

A local response plan, spearheaded by municipal officials, should be developed using input from appropriate members of the community: the public health officer, animal control officer, director of the animal shelter, representatives from each veterinary practice and hospital emergency departments in the area, a representative from the school system, a member of the police department, the local game warden, and others that the planning team may consider relevant. This committee should identify personnel and resources which can provide:

1. Education for school children and the general public to inform them of the risks and what steps they can take to protect themselves against rabies.
2. A strong animal control program enforcing dog licensing to limit stray animals and insuring compliance with vaccination laws for both dogs and cats.
3. A coordinated response team for dealing with rabies exposures, which will address how to deal with the animal involved (including wild animals) and its testing, as well as post-exposure treatment.

When situations of actual or potential rabies exposures occur, it is extremely helpful to have in place a network of people and facilities that can deal with each of the following details:

1. Capture of suspect rabid animals.
2. Euthanasia of suspect animals.
3. Deciding which animals are to be tested for rabies.
4. Decapitation of suspect animals.
5. Preparing and transporting carcasses to the HETL for testing.
6. Disposal of carcasses after decapitation.
7. Facilities which can quarantine dogs and cats which have exposed humans.
8. Personnel to oversee quarantine of owned animals.
9. Professionals who can act as sources of information to the public about rabies issues.
10. Establish a stray animal placement policy.

### **Liability**

The municipality is responsible for expenses incurred in a rabies incident involving a stray domesticated animal. If the suspect animal is owned, the owner is responsible. (See 22 MRSA §1313-B in Appendix G of this manual.) Transportation and testing costs for wildlife is the responsibility of IF&W. The town, usually through the ACO, is responsible for arranging transportation of the animal to the HETL in Augusta.

### **Establishment of a Stray Animal Placement Policy**

Adoption of dogs and cats is an extremely popular way for people to acquire pets. It is important that a policy be established by municipalities and animal shelters for handling their strays. The primary goal should be to protect the human population and to humanely care for the pet population. It would be unfortunate if all adoptions were eliminated due to a rabies panic and tragic, if an exposed animal were adopted out and then developed rabies. It is recommended that impounded, unclaimed stray animals should not be offered for adoption if they have the appearance of having been out in the wild for a considerable period of time, or if they have evidence of wounds of unknown origin. Vaccination status and any wound history should be obtained if possible and evaluated before offering the animal for adoption. If rabies is endemic to the area, adoptive owners should be warned of the threat, especially if their new pet has an unknown vaccination history. Information on rabies should be available to everyone visiting the facility. (See “Your New Pet and Rabies” in the Appendix.)

### **Equipment for the ACO**

The right equipment, in serviceable condition, is essential for an animal control officer to perform his/her duties. Listed below is equipment that is recommended to properly equip the animal control officer:

1. Animal handling gloves - thick bite-proof gloves, elbow length
2. Control pole
3. Muzzle
4. Leash
5. Training choke collar - adjustable chain collar
6. Non-injuring live trap
7. Stretcher or blanket
8. Large cage for transporting live animals
9. Official identification card
10. Printed warnings and calling notices
11. Dog/cat food, water, and containers to hold them
12. Flea spray
13. One gallon of bleach - equipment, cages and contaminated areas and surfaces should be washed with detergent and water, and disinfected with a freshly prepared solution of bleach (1/2 cup per gallon of water).
14. Long handle brush ( toilet bowl brush)
15. Rubber gloves, elbow length
16. Plastic sheeting or body bag
17. Waterproof container
18. Safety goggles or full face mask, and protective covering for clothing

Additional equipment is needed for controlling, capturing and transporting suspected rabid animals. Contaminated areas where the suspected rabid animal's saliva, brain and spinal cord tissues (and possibly blood if the saliva, brain or spinal cord tissues have been mixed together due to shooting or other means) must be secured from humans and animals. For additional information see the “Rabies Testing/Specimen Preparation (Decapitation)” section

# **RABIES RISK REDUCTION**

## **Education**

More than 80% of animal bites to humans are preventable. Over two-thirds of bites occur when humans are petting or feeding wildlife or domesticated animals that they do not know. Education for the general public can reduce or prevent human exposures to potentially rabid animals. Local town officials, including animal control officers and health officers, should make available to residents in their towns any information on rabies produced by the Maine Department of Human Health and Services (DHHS), the Department of Agriculture-Animal Health and Industry, the Maine Department of Inland Fisheries and Wildlife (IF&W), the Maine Veterinary Medical Association; the Maine Federation of Humane Societies, and the Maine Animal Control Officers Association, as well as what is included in this manual.

Education for the general public should emphasize the following steps to decrease human exposure to rabies:

1. Avoid sick or strange acting animals and report them to the local animal control officer.
2. Vaccinate all cats and dogs against rabies, and vaccinate livestock when recommended by a veterinarian.
3. Do not pick up, touch or feed wild animals or unfamiliar animals. Do not leave pet food outside for any reason. Feeding wildlife not only increases the risk of rabies exposure but also is not healthy for the animals themselves. It permits animal populations to increase beyond normal limits and can lead to obesity, dental disease and unnatural social behavior.
4. Do not “rescue” seemingly abandoned baby wild animals. In most cases when a baby animal is found, the parent is nearby waiting for humans to leave. Attempting to raise young wild animals is very rarely successful and even if it is, you are left with a wild animal which does not know how to live in the wild.
5. Do not keep wild or exotic animals as pets. Maine State law requires a permit for wildlife rehabilitators and others having wild animals in their possession. Wildlife hybrids and ferrets are the exception in this state.
6. Use only animal proof trash cans. Garbage attracts wildlife.
7. Cap chimneys and seal openings and cut tree branches that provide access to houses, garages, etc., to prevent raccoons and bats from entering. Raccoons especially have adapted very well to living closely with humans. Although not normally seen due to their nocturnal habits, their numbers are often higher in suburban and urban areas than in more wooded spots due to the presence of food and nesting sites.
8. If bitten or scratched by any animal, one should promptly wash the wounds with soapy water for 10 minutes and see a health care provider immediately.
9. If a pet is bitten or scratched by another animal, gloves should be worn when handling or cleaning the wound. Afterwards, wash hands thoroughly. Contact a veterinarian to determine if the pet requires treatment, including a rabies booster.
10. Teach children to keep a safe distance from wildlife and strays.

## **Pet Vaccination**

A reduction in rabies in both humans and pets was not possible until widespread rabies vaccinations of dogs became available in the 1950's. Vaccination of dogs and cats provides an

effective buffer zone between rabid wild animals and humans, and has been instrumental in reducing the impact of rabies in the United States. It is extremely important that both dogs and cats are vaccinated and boosted at the appropriate time intervals to maintain proper immunity.

Maine law requires that all dogs and cats be vaccinated against rabies (MRSA Title 7, Section 3916 and Section 3922). Much of the effort at the local level to control transmission of rabies between animals and humans focuses upon compliance with vaccination requirements. Animal rabies vaccinations must be administered only by, or under the direct supervision of a licensed veterinarian. This is the only way to ensure that rabies vaccines have been properly administered. Rabies vaccinations given by the owner/keeper of an animal are not acceptable; the animal will not be considered vaccinated in the event of a rabies exposure.

A dog or cat is considered currently vaccinated if at least 30 days have elapsed since the animal's initial vaccination, and the duration of vaccination has not exceeded the time period recommended for that species and brand of vaccine.

All dogs and cats should ideally be vaccinated against rabies for the first time according to the recommendations of the vaccine manufacturer. The animal's first booster (regardless of the age at initial vaccination) should be given one year later. The animal should then receive booster immunizations according to the recommendations of the vaccine manufacturer.

Cats must receive a state approved vaccination certificate. No tags or licensure are necessary for cats at this time.

### **Local Animal Control**

Management of stray and unwanted dogs and cats is also essential to a successful rabies control program. Please refer to rules and regulations in the appendix.

Every municipality is required by state law to have or work with a state licensed animal shelter (MRSA Title 7, Section 3949). It is unlawful for any dog, licensed or unlicensed, to run at large (MRSA Title 7, Section 3911).

### **Wildlife Control and Management**

Inland Fisheries and Wildlife has jurisdiction over the management and control of all wildlife in Maine. Wildlife rehabilitators (who must be licensed) should use extreme caution when handling wildlife. If high-risk species are released, following care and rehabilitation, the release should be in the vicinity from where the animal was taken. This is a rabies control measure and also prevents the animal from being placed in another animal's territory.

The reduction of wildlife populations is not considered a viable approach to rabies management. Removal of specific animals from areas where there is an increased risk to human safety may be considered by the Department of Inland Fisheries and Wildlife.

## HUMAN RABIES IMMUNIZATIONS

Two types of rabies immunizing products are available in the United States for human use. Killed rabies vaccines induce an active immune response that includes the production of neutralizing antibodies in approximately 7-10 days, and usually persists for more than two years. Rabies immune globulin (RIG) provides a rapid but short-term passive immunity with an approximate half-life of 21 days.

**Table 1: RABIES BIOLOGICS AVAILABLE IN THE U.S.**

<b>Biologic Type</b>	<b>Product Name</b>	<b>Manufacturer</b>
<b>Human Rabies Vaccine</b> Human Diploid Cell Vaccine (HDCV)	Imovax Rabies	Pasteur-Merieux Serum et Vaccins, Connaught Laboratories, Inc. Phone: (800) 822-2463
	RabAvert	Chiron Corporation Phone: (800) 244-7668
<b>Rabies Immune Globulin (RIG)</b>	Imogam Rabies-HT	Pasteur-Merieux Serum et Vaccins, Connaught Laboratories, Inc. Phone: (800) 822-2463
	BayRab	Bayer Corporation Pharmaceutical Div. Phone: (800) 288-8370

### PRE-EXPOSURE VACCINATION FOR PERSONS AT HIGH RISK

Human pre-exposure vaccination against rabies, a series of three injections over a period of 3-4 weeks, is given prior to exposure to the disease. Pre-exposure vaccination is given for three primary reasons: 1) to protect the person against an unknown or unrecognized exposure to the rabies virus, 2) to reduce the amount of treatment needed after a known exposure, and 3) to protect those whose post-exposure treatment is delayed.

***PRE-EXPOSURE VACCINATION DOES NOT ELIMINATE THE NEED FOR PROMPT POST-EXPOSURE PROPHYLAXIS FOLLOWING AN EXPOSURE; IT ONLY ELIMINATES THE NEED FOR RABIES IMMUNE GLOBULIN (RIG) AND DECREASES THE NUMBER OF DOSES OF KILLED VACCINE REQUIRED.***

Pre-exposure rabies vaccination should be offered to persons in high-risk groups, such as veterinarians, veterinary technicians, animal control personnel, wildlife rehabilitators, taxidermists, trappers, and rabies testing/research laboratory workers. Pre-exposure vaccination should also be considered for other persons whose activities bring them into frequent contact with potentially rabid animals or their CNS tissue. International travelers might be candidates for pre-exposure vaccination if they are likely to have contact with animals in areas where dog rabies is enzootic, and immediate access to appropriate medical care and biologics might be limited.



**Table 2: HUMAN PRE-EXPOSURE VACCINATION GUIDE**

<b>Risk Category</b>	<b>Nature of Risk</b>	<b>Typical Population</b>	<b>Pre-Exposure Recommendation</b>
Continuous	Virus present continuously, often in high concentrations. Specific exposures likely to go unrecognized. Aerosol, mucous membrane, bite or non-bite exposure.	Rabies research lab workers (1), rabies biologics production workers.	Primary course. Serologic testing every 6 months; booster vaccination when antibody titer falls below acceptable level (2).
Frequent	Exposure usually episodic, with source recognized. Exposure may also be unrecognized. Aerosol, mucous membrane, bite, or non-bite exposure.	Rabies diagnostic lab workers (1), spelunkers, veterinarians and staff, animal control and wildlife workers in rabies enzootic areas.	Primary course. Serologic testing every 2 years; booster vaccination when antibody titer falls below acceptable level (2).
Infrequent (greater than population at large)	Exposure nearly always episodic with source recognized. Mucous membrane, bite, or non-bite exposure.	Veterinarians, animal control and wildlife workers in areas with low rabies rates. Veterinary students. Travelers visiting foreign areas of enzootic rabies for more than 30 days.	Primary course. No serologic testing or booster vaccination.
Rare (population at large)	Exposures always episodic with source recognized. Mucous membrane, bite, or non-bite exposure.	U.S. population at large, including persons in rabies epizootic areas.	No vaccination necessary.

1. Judgment of relative risk and extra monitoring of vaccination status of laboratory workers is the responsibility of the laboratory supervisor.
  2. Minimum acceptable antibody level is complete virus neutralization at a 1:5 serum dilution by rapid fluorescent focus inhibition test (RFFIT). Booster dose should be administered if the titer falls below this level.
- (Adapted from: CDC.MMWR 1999; No RR-1)

### **Pre-Exposure Vaccination Protocol**

Human pre-exposure vaccine is administered intramuscularly (1.0 ml) in the deltoid region with either the HDCV or PCEC vaccines. The initial regimen consists of three doses of vaccine, one each administered on days 0, 7, and 21 or 28.

Persons receiving both pre-exposure rabies vaccination and **malaria chemoprophylaxis** should complete the entire rabies vaccination series prior to beginning malaria chemoprophylaxis. Chloroquine has been shown to interfere with the development of an antibody response to the rabies vaccines, and it should be assumed that mefloquine and other related antimalarials will also interfere with a vaccinee's development of protection against rabies.

**Table 3: HUMAN PRE-EXPOSURE VACCINATION SCHEDULE**

Type of Vaccination	Route	Regimen
Primary	IM	HDCV or PCEC, 1.0 ml (deltoid area), one each on days 0*, 7, & 21 or 28
Booster**	IM	HDCV or PCEC, 1.0 ml (deltoid area), day 0* only

HDCV=human diploid cell vaccine; PCEC=purified chick embryo cell vaccine.

\* Day 0 is the day the first dose of vaccine is administered.

\*\* Administration of routine booster dose of vaccine depends on exposure risk category as noted in Table 2.

(Adapted from: CDC.MMWR 1999; No RR-1)

### Booster Doses

Rabies antibody titers should be checked regularly according to risk category (see Table 2), and a single booster dose of either HCDV or PEC should be administered only if the titer is less than complete neutralization at a 1:5 serum dilution by the Rapid Fluorescent Focus Inhibition Test (RFFIT). Administering routine rabies boosters without a titer reference is not recommended.

### Serologic Testing

An acceptable antibody titer is considered to be 1:5 or greater. As stated above, when a titer is measured at less than 1:5, a booster dose of rabies vaccine is recommended. Two types of test options are generally offered. In a *screen test*, the serum is tested at two dilutions only and simply tells the patient if a booster dose of rabies vaccine is indicated. An *end-point titer test* is used to measure the exact titer level by testing the serum at serial dilutions until an end-point is reached. All labs require 2 mls of refrigerated serum. Contact the laboratory by phone or through a website address to receive the proper forms and shipping instructions.

Routine serologic testing following the primary pre-exposure series is not necessary due to the excellent antibody response following the recommended vaccination protocol. Persons in the *Continuous* or *Frequent* risk categories should receive regular serologic evaluation of their rabies antibody titer per Table 2.

The **exception** to this are those patients suspected of being immunosuppressed while undergoing the primary pre-exposure vaccination series. Patients who are immunosuppressed by disease or medications should consider avoiding activities for which rabies pre-exposure prophylaxis is indicated so that they may postpone pre-exposure vaccinations. If that is not possible, immunosuppressed persons who are at risk for rabies exposure should be vaccinated and their antibody titers checked to confirm seroconversion after the vaccination series is completed. Failures to seroconvert after the third dose should be managed in consultation with the Bureau of Health.

The rise of rabies in animals has led to an increase in the number of people who receive *post*-exposure treatment. While today's vaccine is extremely effective, easier to administer and less painful than in the past, it is very expensive. More than 20,000 people receive *post*-exposure prophylaxis in the U.S. every year at a cost of over \$50 million. The estimated cost per person for rabies post-exposure treatment is \$2000 to \$3,000. The cost of rabies *pre*-exposure treatment is a fraction of that cost. Information for physicians to obtain human diploid cell vaccine (HDCV), manufactured by Pasteur-Merieux Serum et Vaccine and distributed by

Connaught Laboratories, Inc. is available by calling 1-800-VACCINE (800-822-2463); to obtain purified chick embryo cell vaccine (PCEC) call 1-800-Chiron8 (800-244-7668).

# **HUMAN RABIES EXPOSURE ASSESSMENT/TREATMENT**

## **Clean the Wound**

All bite and scratch wounds should be thoroughly cleaned as soon as possible by scrubbing with soap and water for 10 minutes; in animal studies, thorough wound cleansing alone without other post-exposure prophylaxis (PEP) has been shown to markedly reduce the likelihood of rabies infection. Thorough wound cleansing will also help prevent other common bite wound infections. A virucidal agent, such as povidone-iodine solution, may also be used to clean the wound. Tetanus prophylaxis and measures to control bacterial infection also should be administered as indicated. The decision to suture large wounds should take into account cosmetic factors and the potential for bacterial infections.

## **Contact Health Care Provider**

After cleaning the wound, the victim or parent should immediately contact a health care provider for treatment of the wound and evaluation for post-exposure treatment for rabies.

## **TREATMENT RATIONALE**

Physicians must individually evaluate each human exposure to a potentially rabid animal. These exposures are rarely clear-cut issues, and treatment decisions must take into account a variety of factors. The following factors should always be evaluated and communicated with the patient before specific rabies post-exposure treatment is initiated: 1) type of exposure, 2) the extent or severity of the exposure 3) type of animal species involved, 4) vaccination status of the animal, 5) circumstances (i.e., provoked vs. unprovoked) leading to the bite or other exposure, 6) availability of the animal for quarantine or testing, and 7) presence of rabies in the region. State public health officials should be consulted if questions arise about the need for rabies prophylaxis. Due to periodic nationwide shortages of human rabies immune globulin, the potential for adverse reactions to immunizations, and the costs of treatment, rabies biologics should be used appropriately and judiciously.

The “Rabies Exposure Assessment Algorithm” should be used to help determine if post-exposure prophylaxis is required. *This algorithm may also be downloaded from [www.maine.gov/dhhs/boh/ddc/](http://www.maine.gov/dhhs/boh/ddc/). It is especially recommended that the algorithms be posted or filed in hospital emergency departments for quick reference and guidance.* Consultation for assessing the need for rabies post-exposure prophylaxis is available by calling the Division of Disease Control at 287-8773, or (800) 821-5821.

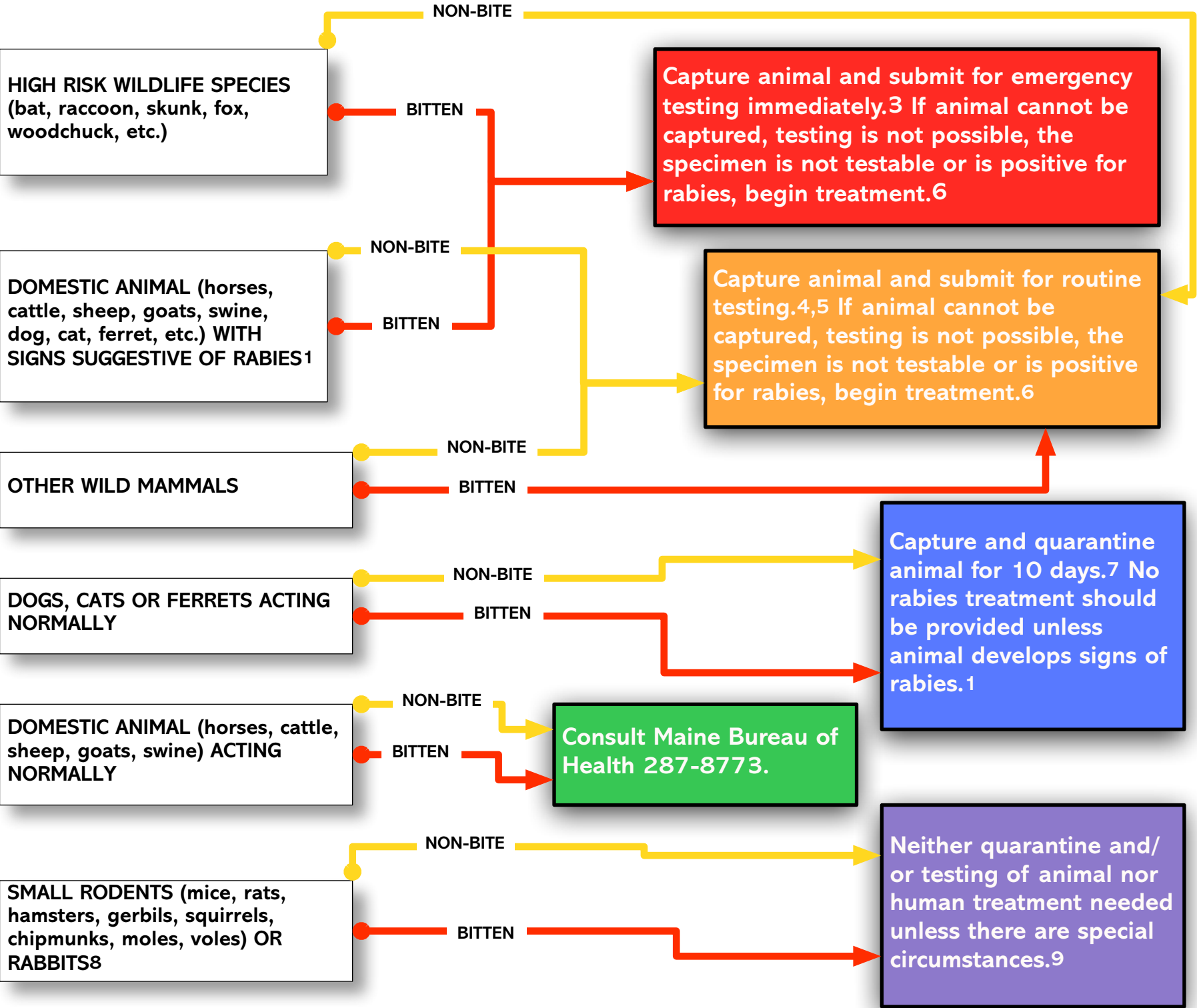
**Physicians are required to report rabies post-exposure prophylaxis treatment to the Maine Bureau of Health, Division of Disease Control, State House Station 11, Key Plaza 8<sup>th</sup> Floor, Augusta, Maine 04333, or call 287-8773 or 1-800-821-5821.**

After reviewing the circumstances surrounding the bite, the physician can determine the need for rabies treatment. The correct rabies post-exposure schedule will depend on whether or not the individual has ever received pre-exposure treatment; refer to “Human Post-Exposure Prophylaxis Schedule,” which follows in Figure 1.

# Figure 1. RABIES EXPOSURE ASSESSMENT ALGORITHM FOR HUMANS

Follow procedure indicated for extent of exposure (whether bitten or otherwise exposed<sup>2</sup>) according to type of animal contact.

TYPE OF ANIMAL CONTACTED



**Health care providers should consult with the Bureau of Health, 287-8773 or 1-800-821-5821, before starting any rabies treatments, except in those cases where prior notification would compromise the health of the patient.**

## FOOTNOTES

- 1** Rabid-acting: a combination of neurologic signs, best interpreted by a veterinarian, including a change in or unusual behavior, extreme aggressiveness, paralysis, convulsions, excess salivation, difficulty eating or drinking, unusual vocalizations.
- 2** Otherwise exposed: see "Rabies Management Guidelines" for a more complete definition of exposure; includes scratches or other fresh wounds or mucous membranes contaminated with the animal's saliva; also includes a 'reasonable probability' of an undetected bite from a bat, as evidenced by direct skin contact with a bat, or a bat found in the room with a sleeping person, unattended child or person with mental impairment. (Guidelines available at [www.maine.gov/dhhs/etl/rabies/rabies.htm](http://www.maine.gov/dhhs/etl/rabies/rabies.htm))
- 3** Emergency testing: requires phone consultation with Health & Environmental Testing Laboratory (HETL), 287-2727 during business hours, and requires driving specimen to the HETL.
- 4** Routine testing: See specimen submission guidelines in "Rabies Management Guidelines" or call 287-2727. All efforts should be made to capture and test animals when there has been a possibility of exposure, because most will be negative for rabies and will eliminate the need for rabies treatment.
- 5** Rabies treatment should not be started when animal capture, confinement, euthanasia, specimen shipment, or testing is in process to determine the rabies status of the animal, unless it is a high-risk head wound and the animal has a high probability of being rabid.
- 6** Except for those previously vaccinated, rabies treatments include five 1.0 mL doses of vaccine administered IM in the deltoid area on days 0, 3, 7, 14, and 28; and a single dose of human rabies immune globulin (HRIG), preferably administered on day 0, but may be given through the seventh day after administration of the first vaccine dose. To avoid treatment failure, all the RIG must be infiltrated into and around the wounds [20 IU/kg body weight; calculation formula: #cc=(weight in lbs x 9.09)/150]. If not feasible due to the wound site, a mucous membrane exposure, or unknown exposure site in 'reasonable probability' bat exposures, administer HRIG IM at a site distant from vaccine administration (e.g., deltoid of opposite arm from one receiving vaccine). Those with certain types of previous rabies immunization should receive treatment consisting of vaccine only, given on days 0 and 3. For details on appropriate treatment regimens see "Rabies Management Guidelines" listed above.
- 7** Capture, confine, and observe animal for 10 days: All efforts should be made to capture the animal and place it under a 10-day confinement and observation for rabies signs. If the animal is observed to be symptom-free during the 10-day confinement, it did not have rabies virus in its saliva at the time of exposure, and no human rabies treatment is needed. If the animal is not up-to-date on its rabies vaccinations, confinement must be done in an appropriate facility (veterinary office, kennel, shelter). If the animal is not available for testing or quarantine, additional factors may be considered in determining the need for human rabies treatment, including animal behavior, species-specific incidence, circumstances of exposure, sightings of a healthy but uncaptured animal during the 10-day period, etc.
- 8** Small rodents (mice, rats, hamsters, gerbils, squirrels, chipmunks, moles, voles) and rabbits have not been found rabid in Maine, so they should not be submitted for testing unless there are unusual circumstances and there is consultation with the Bureau of Health. Similarly, persons should not be provided rabies treatments for exposures unless there are unusual circumstances and there is consultation with the Bureau of Health.
- 9** Unusual circumstances: If there has been a bite from a small rodent or rabbit, the animal is available for testing, and there is considerable concern about the incident and/or the animal has been acting rabid, the animal may be submitted for routine rabies testing. In the U.S., pet rabbits caged outside have developed rabies (probably because the cage protected them from more serious wounds that would have led to their deaths). This information should be provided to the bite victims and considered when reaching a decision about testing the animal.

## **Type of Exposure**

Rabies is transmitted to humans only by directly introducing the virus into open cuts or wounds in the skin, or by introducing the virus onto mucous membranes. If no exposure has occurred, post-exposure prophylaxis is not indicated. The likelihood that rabies infection will result from exposure varies with the nature and extent of exposure. *All bites represent a potential risk of rabies transmission.* Non-bite exposures from terrestrial animals rarely cause rabies. Undetected bite exposures to bats are increasingly being linked to human rabies cases in the United States.

### Bite

Any penetration of the skin by teeth.

### Nonbite

Scratches, abrasions, open wounds, or mucous membranes which have been contaminated with saliva or neural tissue (brain, spinal cord, etc.) from a rabid animal are considered exposures.

**Blood, urine, and feces are not infectious for rabies - contact with these substances alone does not constitute a potential rabies exposure. Neither casual contact, such as petting a rabid animal, nor a claw scratch by a domestic animal constitute an exposure to rabies, and neither are indications for prophylaxis.**

There have been two instances of airborne rabies that were acquired in the laboratory, and two possible airborne rabies cases acquired in a heavily bat-infested cave in Texas. The airborne route of transmission is exceedingly rare and is not expected to occur during typical bat-associated events.

### Secondary exposure or “contact-transfer”

**Secondary exposure scenarios (i.e. dog or cat fights with skunk and then transports infectious material from the skunk to human contact) are hypothetical and very unlikely to transmit rabies.**

These situations are common, but are unlikely to require rabies post-exposure treatment unless there is clear indication that neural tissue or copious amounts of saliva from a rabid animal were transferred by the pet to eventually contaminate a fresh (less than 24 hours old) skin wound or mucous membrane.

Rabies virus is very fragile outside of the nervous tissue of the rabid animal and does not survive for appreciable amounts of time on environmental surfaces. Post-exposure prophylaxis is generally NOT indicated under these secondary exposure incidents. Consultation with an epidemiologist in the Division of Disease Control at 287-8773, or (800) 821-5821, is encouraged for discussion of specific cases.

### Accidental Human Exposure to Animal Vaccine

Accidental inoculation may occur during administration of animal rabies vaccine. Such exposure to inactivated vaccine constitutes no rabies hazard. However, a new category of animal

rabies vaccines are vaccinia-vectored. Because vaccinia virus can infect humans and pose a risk for immunocompromised individuals, accidental exposures to this type of rabies vaccine should be reported to the Division of Disease Control at 287-8773, or (800) 821-5821.

## **Type of Animal Involved in Exposure Incident**

### *Dogs, Cats, and Ferrets*

Bites from dogs, cats, and ferrets pose a potential risk of rabies transmission. The driving strategy for managing bite incidents involving these animals is to locate the animal for observation or testing. A healthy domestic dog, cat, or ferret that bites a person may be confined and observed for 10 days. No decision for post-exposure prophylaxis is necessary while the animal is being observed. Dogs, cats, and ferrets with a veterinary record of current rabies vaccination status pose an extremely low risk and may be managed through home confinement and observation. Pets with no current history of rabies vaccination by a veterinarian must be quarantined at a veterinary hospital or recognized animal control facility according to state rabies control regulations

**If a biting dog, cat, or ferret is unavailable for testing or observation, the recommendation for rabies post-exposure prophylaxis is determined on a case-by-case basis. Every effort should be made to locate and apprehend the animal for quarantine or testing. If the biting animal is not in custody, but there is a reasonable expectation that the animal can be located and apprehended, consult with the Division of Disease Control at 287-8773, or (800) 821-5821, to determine if post-exposure prophylaxis may be delayed**

### *Wild Animals*

Some animals are much more likely to be infected with rabies virus than others. For example, carnivorous wild animals (especially skunks, raccoons, foxes, coyotes, bobcats) and bats are the animals most commonly infected with rabies.

**Rabies testing of higher risk wild animals is usually the primary objective. Occasionally, the wild animal has been caged under human care and observation (e.g. zoo, wildlife rehabilitator, pet) and a rabies quarantine may be imposed.**

It is preferred that post-exposure prophylaxis be delayed pending the outcome of rabies test results. Whenever treatment has been initiated and subsequent testing shows that the exposing animal is negative for rabies, treatment can be discontinued.

When a wild animal is unavailable for testing, circumstances leading to the bite and the epidemiology of rabies in the animal species of question should be evaluated.

### *Livestock and Other “Domesticated” Animals*

Livestock, such as horses, cows, pigs, and “domesticated” wild animals, such as monkeys and llamas, may be infected with rabies, but are considered less likely to be involved in the transmission of rabies. In almost all of these types of bite events, the animal will be confined and readily available for investigation and a rabies risk assessment.

**Human rabies post-exposure prophylaxis need not be initiated pending completion of a thirty (30) day quarantine and rabies observation period, or the results of rabies testing are known.**

#### Small Rodents, Opossums and Lagomorphs

Small rodents (such as squirrels, hamsters, prairie dogs, gerbils, chipmunks, gophers, rats, mice, etc.) and lagomorphs (such as rabbits and hares) are only rarely found to be infected with rabies and have not been known to cause human rabies in the United States. The reason for this appears to be that these small animals are unlikely to survive an attack from a rabid animal to subsequently develop the disease. Cage-raised animals (hamsters, gerbils, mice, rats, rabbits, etc.) that have been totally confined to an indoor cage are not routinely tested. However, there have been a small number of rabies in rabbits that had been exposed to rabid raccoons while outside. **In most cases, bites or other exposures from small rodents and rabbits do not require testing the animal or rabies post-exposure prophylaxis, unless the animal demonstrated unusual aggression or neurologic symptoms, or had been housed outdoors.**

Opossums have been shown to have a high resistance to infection with the rabies virus and are considered low risk animals for the spread of rabies. **Large rodents like groundhogs or muskrats, however, are more likely to be infected with rabies and exposures involving these animals should be given close evaluation.**

#### Bats

Bats are increasingly implicated as significant wildlife reservoirs for strains of rabies virus transmitted to humans, with the majority of recent human rabies cases being attributed to bat strains of the virus. Recent epidemiological data suggests that transmission of rabies virus may occur from minor or seemingly insignificant physical contact with bats. From 1990 to 2005, there have been 44 human rabies cases, 37 of which were infected with U.S. indigenous rabies variants. 35 of these 37 cases (94.6%) were infected with bat-associated rabies. Not including the four of these 35 bat-associated rabies cases that were infected by receiving infected organs or tissues, 19% of the human cases with bat-associated rabies involved a definite history of a bite, and known contact with a bat without discernible bite or other injury occurred in approximately half of the cases. **Because of this, in all instances of potential human exposures involving bats, the bat in question should be safely collected if possible, and submitted for rabies testing.**

**Rabies post-exposure prophylaxis is recommended for all persons with bite, scratch, or mucous membrane exposure to a bat, unless the bat tests negative for rabies.** Post-exposure prophylaxis may be appropriate even in the absence of a demonstrable bite, scratch, or mucous membrane exposure, particularly in situations in which there is *reasonable probability* that such exposure to a bat may have occurred. Some examples are: a sleeping individual awakes to find a bat in the room, or an adult witnesses a bat in the room with a previously unattended child, mentally challenged person, or intoxicated individual.

#### Human to Human

Although it can occur, human to human rabies transmission is rare. There are documented cases of human rabies in recipients of infected corneal and organ transplants, and two other cases may be attributable to exposure to infectious human saliva. There is one report of transplacental



transmission of rabies to a human infant. Persons who are receiving rabies immunizations, or who have been recently exposed to a known or suspected rabid animal are NOT capable of transmitting rabies.

### **Circumstances of Biting Incident and Vaccination Status of Exposing Animal**

An **unprovoked** attack is more likely than a provoked attack to indicate that the animal is rabid. A **provoked** incident occurs when a person creates a situation that makes an animal feel threatened and causes them to react by biting or scratching. **Provocation is judged from the animal's perspective.** An animal will be provoked by infringement on its territory, menacing gestures, handling its young, or fear of injury. Bites inflicted on a person attempting to feed or handle an apparently healthy animal should generally be regarded as provoked.

A currently vaccinated dog, cat, ferret, horse, or sheep is unlikely to become infected with rabies.

### **Epidemiology of Rabies in a Geographic Locale**

Incidence of animal rabies does vary within the state of Maine. However, only animals that have contact with humans, pets, or livestock are tested, so this data is skewed, and animal rabies should be considered endemic throughout the state. Refer to the Appendix for animal rabies statistics for Maine.

### **POST-EXPOSURE PROPHYLAXIS (PEP) PROTOCOL**

There are two regimens for rabies post-exposure prophylaxis depending upon whether or not the exposed patient has previously completed a pre-exposure series of a cell culture rabies vaccine, has received post-exposure treatment for a prior rabies exposure event, or has previously been vaccinated with any other type of rabies vaccine and a documented history of antibody response.

#### **PEP for Persons NOT Previously Vaccinated**

If the individual has neither received adequate pre-exposure immunizations nor been previously treated for a rabies exposure, then the post-exposure protocol is:

1. RIG: 20 IU/kg body weight on day 0. Infiltrate the **entire** dose into the region of the bite wound; if this is not anatomically feasible, infiltrate as much of this dose as possible into the bite wound, and inject any remaining volume at distant intramuscular site(s).

RIG is administered only once at the beginning of post-exposure prophylaxis. It is used to provide immediate antibodies until the patient's own immune system responds to immunization. ***If RIG was inadvertently not given when rabies vaccination was begun, it can be given up to the seventh day after the dose of vaccine was given.*** After the seventh day, RIG is contraindicated because an active antibody response to the vaccine has presumably occurred. The recommended dose of RIG is 20 IU/kg or 9.09 IU/lb of body weight. If anatomically feasible, the full dose should be infiltrated around the wound(s); if this is not possible, as much volume as possible should be injected at the wound site and any remaining volume

should be administered intramuscularly at an anatomical site(s) distant from vaccine administration. RIG should not be administered in the same syringe as the vaccine or at the same site as vaccine. As the RIG may partially suppress active production of antibody, no more than the recommended dose should be given. **Prophylactic failure has occurred in other countries when RIG was not given or was administered incorrectly.**

2. HDCV or PCEC vaccine: 1.0 ml administered intramuscularly in the deltoid area on days 0, 3, 7, 14, and 28.

Either of the two rabies vaccines currently available in the United States can be administered in conjunction with RIG at the beginning of post-exposure therapy. A regimen of five 1-ml doses of HDCV or PCEC should be administered intramuscularly. The first dose of the five-dose course should be administered as soon as possible after exposure. Additional doses should be administered on days 3, 7, 14, and 28 after the first vaccination. For adults, the vaccination should always be administered intramuscularly in the deltoid area. For small children, the anterolateral aspect of the thigh is preferred. The gluteal area should never be used for HDCV or PCEC injections because administration in this area results in lower neutralizing antibody titers.

The schedule for the vaccine doses should be adhered to as closely as possible, especially the first three. The timing of the first three doses plus RIG is most critical. However, a one day variation in the schedule is not likely to be clinically significant. If a patient is off-schedule by greater than 2 days, timing for the remaining schedule should be evaluated on a case-by-case basis. *Under no circumstances should the series be re-started or any additional RIG given.*

### **PEP for Persons Previously Vaccinated**

The recommended regimen for an individual who has previously received either the pre-exposure rabies vaccination series OR post-exposure rabies prophylaxis is:

1. **No RIG**
2. HDCV or PCEC vaccine: 1.0 ml administered intramuscularly in the deltoid area on days 0 and 3, with the same requirements as noted above.

**Table 4: HUMAN POST-EXPOSURE SCHEDULE OF TREATMENT**

<b>Vaccination Status</b>	<b>Treatment</b>	<b>Regimen</b>
Not Previously Vaccinated	Local Wound Cleansing	All post-exposure treatment should begin with immediate thorough cleansing of all wounds with soap and water
	Human Rabies Immune Globulin (HRIG)	20 IU per kg body weight. As much as possible of the full dose should be infiltrated into and around the wound(s), and the remainder should be administered intramuscularly at an anatomical site distant from vaccine administration. HRIG should not be administered in the same syringe as vaccine. Because HRIG may partially suppress active production of antibody, no more than the recommended dose should be given.
	Vaccine	1.0 ml of human diploid cell vaccine (HDCV) or purified chick embryo cell culture (PCEC) vaccine administered intramuscularly (deltoid area), on days 0, 3, 7, 14, and 28 (day 0 indicates the first day of treatment).
Previously Vaccinated	Local Wound Cleansing	All post-exposure treatment should begin with immediate thorough cleansing of all wounds with soap and water.
	Vaccine	HRIG should <b>NOT</b> be given. 1.0 ml of HDCV or PCEC administered intramuscularly (deltoid area) on days 0 and 3.

\* These regimens are applicable for all age groups, including children.

\*\* The deltoid is the only acceptable site of vaccination for adults and older children. For younger children, the outer aspect of the thigh may be used. Vaccine should never be administered in the gluteal area.

\*\*\* Any person with a history of pre-exposure vaccination with HDCV or PCEC; previous post-exposure prophylaxis with HDCV or PCEC; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the previous vaccination.

\*\*\*\* If RIG was inadvertently not given when rabies vaccination was begun, it can be given up to the seventh day after the dose of vaccine was given.

## **ADVERSE REACTIONS TO RABIES BIOLOGICS**

Treatment with rabies vaccine and rabies immune globulin is not completely risk free. As with any biological, adverse reactions may occur following the administration of approved human rabies vaccines or RIG. Although life-threatening reactions are very rare, decisions on the necessity for rabies post-exposure prophylaxis in non-bite exposures need to include consideration of the risk of the treatment. Health care providers are referred to “Human Rabies Prevention – United States, 1999” (Centers for Disease Control and Prevention, MMWR;1999:Vol. 48, No. RR-1), for more details on the types of adverse reactions that can occur, and recommendations for their management.

In general, reactions are more likely to occur in persons receiving pre-exposure boosters than in those receiving post-exposure treatment. Depending on the type of reaction, switching to another manufacturer's rabies vaccine may reduce the reaction during future immunizations. Studies have revealed a higher rate of post-vaccinal reactions to HDCV as compared to PCEC in both primary and booster vaccinations. Immunosuppressive therapy, such as corticosteroids, should never be used to prophylactically treat rabies vaccination reactions, because it may reduce the success of the post-exposure treatment. If corticosteroids are inadvertently used, a serum sample for rabies antibody testing should be collected 14-28 days after the final vaccine dose to verify response to post-exposure treatment.

**Pregnancy**

Because of the potential consequences of inadequately treated rabies exposure and because there is no indication that fetal abnormalities have been associated with rabies vaccination, pregnancy is not considered a contraindication to post-exposure prophylaxis. If the risk of exposure to rabies is substantial, pre-exposure prophylaxis might also be indicated during pregnancy.

# MANAGEMENT OF ANIMALS THAT POTENTIALLY EXPOSE HUMANS TO RABIES

Animal bites, particularly dog bites, are a huge public health problem. There are an estimated 3.5 million dog bites in the United States every year; eighteen to twenty people die each year in the U.S. from dog attacks. Most bite victims are children under the age of 10 and potentially suffer disfiguring physical injuries and emotional distress. Animals bite to express aggression, fear, territoriality, possession, or a need to escape. Therefore, an animal bite does not necessarily equal a rabies exposure. The spectrum of rabies risk associated with an animal bite ranges from an unvaccinated animal displaying unusual behavior posing the highest risk to a strictly indoor, vaccinated pet at the lowest risk for a rabies exposure.

Dog and cat bites occurring within city limits should be reported to the municipal animal control department for investigation and management. Dog and cat bites occurring outside city jurisdiction and bites from livestock, wildlife, or exotic animals should be reported to the IFW. Those animals involved in a bite to a human will be managed according to:

- type of animal inflicting the bite
- vaccination status of the animal (when applicable)
- nature and circumstances of the bite
- relationship of the animal owner to the bite victim

## **Control of suspect animal:**

If an animal must be destroyed, it should never be shot in the head. The intact brain must be available if testing for rabies is warranted. The contaminated area in which the nervous system tissue, blood or saliva has splattered must be isolated from humans and animals until the live virus is dead or destroyed by natural sunlight (drying) or disinfecting. Freezing of tissue or saliva does not kill the virus.

A suspect animal that is captured alive should be managed according to post-exposure procedures as described according to “Maine Statutes and Rules Relating to Rabies Control” in Appendix G of this manual.

The HETL (287-2727) will perform rabies tests on wild or domesticated animals that have exposed humans or domesticated animals. All animals except bats should be decapitated.

## **Dogs, Cats, and Ferrets**

### ***Routine Circumstances***

An owned dog, cat, or ferret that is **currently vaccinated** by a licensed veterinarian with an approved rabies vaccine and has not inflicted severe injury (multiple deep bites, broken bones or lacerations requiring multiple sutures) may be allowed to be placed in a home quarantine until the end of a ten (10) day period from the bite. **NOTE:** A serological titer does not provide proof of protection against rabies – AN OTHERWISE UNVACCINATED ANIMAL WITH A “PROTECTIVE TITER” IS CONSIDERED UNVACCINATED AND UNPROTECTED.

An owned dog, cat, or ferret that bites a member of the immediate family (first party relationship) and is apparently healthy at the time of the bite incident may be allowed to be confined and observed on the owner's property regardless of vaccination status. The owner will be required to update the rabies vaccination on any unvaccinated pets after completion of the ten (10) day home observation period.

An owned dog, cat, or ferret that has **never** been vaccinated or is **overdue** on its rabies vaccination should be placed in quarantine at a veterinary facility or recognized animal control facility for a period of ten days measured from the day of the bite. Prior to discharge from the veterinarian's supervision, the animal will be vaccinated against rabies.

Owners of quarantined animals should be given information about rabies and quarantine conditions. (See "Quarantine Notice" in the Appendix) If rabies virus were present in the saliva at the time of the bite, the biting animal would most likely be exhibiting obvious symptoms of rabies already, or would be expected to do so within the next ten days. The rabies virus does not migrate to salivary glands until after it has reached the brain. If the biting dog, cat or ferret is healthy for a period of 10 days following the bite, rabies virus was not present in the saliva at the time of the bite.

Animals which are not euthanized before the end of the 10-day period must be examined by a veterinarian; if healthy, the animal should be vaccinated or boosted for rabies, if needed, before release from quarantine. **Dogs, cats, and ferrets should not be vaccinated until completing the 10-day quarantine.**

A **stray or unwanted** dog, cat, or ferret that has bitten a human must be quarantined for 10 days in a state licensed animal shelter OR euthanized and tested for rabies; euthanasia and testing must be coordinated with the HETL and the municipality (since any expenses for decapitation, transport and testing are the municipalities' responsibility). If the animal is quarantined, upon successful completion of the 10 day observation period, the stray may be vaccinated against rabies and placed for adoption at the discretion of the animal control authority.

### ***Special Circumstances***

When an animal bite report involves special circumstances, consult the Division of Disease Control at 287-8773, or (800) 821-5821, for direction on case management. Minor or superficial "nips" or puncture wounds to the face can be managed routinely as described above. Special circumstances include, but are not limited to: bites resulting in broken bones or deep lacerations requiring multiple sutures, a moderate or severe bite to the face or neck, or multiple bite wounds, service dogs or police/search and rescue dogs, female dog with a litter of unweaned puppies, biting animal not identifiable in a group or litter, and biting animal transported out-of-state.

All dogs, cats, and ferrets showing signs of rabies (i.e. unprovoked aggression, impaired locomotion, paralysis, depression, etc.) at the time of human exposure must be examined by a veterinarian to determine if quarantine or euthanasia and testing is appropriate, regardless of the animal's vaccination status. If any animal begins to show any illness or unusual behavior during quarantine, it must be immediately examined by a veterinarian. If signs are compatible with rabies, the animal must be euthanized, decapitated if necessary by a veterinarian, and the head

submitted for testing. If the signs of illness are determined to be incompatible with rabies, the animal can be treated appropriately by the veterinarian presiding over the animal's care and remain under observation. Except for shipping and any veterinary fees, there is no cost to the public for rabies testing of the suspect animal.

### **Domesticated Livestock and Owned Exotic Animals**

This category includes a broad range of animals from horses, goats, and Vietnamese pot-bellied pigs to more exotic animals kept as pets or on display to the public, such as lions and monkeys. **All bite reports involving this category of animal should be forwarded to the Division of Disease Control at 287-8773, or (800) 821-5821, as soon as possible.** The Bureau of Health Division of Disease Control has the authority to determine the disposition of any livestock animal or owned exotic animal that bites a person.

Common livestock are not usually at high risk for transmitting rabies to humans. If livestock bite, scratch, or otherwise expose a human, the risk of a rabies exposure will be determined by the animal's health and behavior, its vaccination status, whether rabies is endemic in the area, the potential for prior exposure of the animal to a rabies vector, and the epidemiology and risk of rabies in the species of animal causing the bite. **Prior rabies vaccination may not preclude the necessity for euthanasia and testing.**

If the biting livestock or exotic animal is determined to pose a significant risk of a rabies exposure, the Bureau of Health Division of Disease Control will order the animal to be humanely killed and the brain submitted to HETL for rabies testing.

No scientifically proven period of quarantine (like the 10-day period for dogs, cats, and ferrets) exists for livestock. If a livestock species is to be quarantined, the Maine Bureau of Health will designate an appropriate quarantine. The quarantined animal should be isolated in a secure stall or separate pen apart from other animals for the designated quarantine period (determined by). Human contact should be minimal. If the animal escapes and is unable to be observed for the designated quarantine period, the Bureau of Health should be notified immediately. Quarantines will be the direct responsibility of the owner; however an ACO will monitor the quarantine. A licensed veterinarian must examine the animal at the start of and at the end of the quarantine period.

Provided that the quarantined animal does not exhibit signs of rabies, the following is permitted:

1. Milking of rabies-vaccinated dairy cows.
2. Shearing of sheep.
3. Slaughter for food use, provided that 21 days have passed since the last rabies vaccination.

If quarantined livestock exhibits abnormal behavior at any time during the designated quarantine period, a veterinarian should examine the animal to determine if euthanasia and testing is warranted.

If the animal is euthanized or dies before the end of the designated quarantine period, it must be decapitated by a veterinarian and the head sent to the HETL for rabies testing.

Livestock showing signs of abnormal behavior in areas where rabies is known to exist should be suspected of rabies. (See section on signs of rabies in livestock.) A veterinarian should examine such animals and determine if euthanasia and testing is warranted.

Rendering of animals showing signs of rabies, or confirmed with rabies, is prohibited. In all questionable cases of livestock human exposure the Bureau of Health should be consulted.

### **Rodents and Lagomorphs (Rabbits)**

Small rodents (such as squirrels, chipmunks, gophers, rats, and mice), opossums, and lagomorphs (such as rabbits and hares), have only rarely found to be infected with rabies, and have never been implicated as the source of human rabies. Consequently, these types of animals are considered as extremely low rabies transmission risks. Bites from small rodents, squirrels, rabbits, or opossums will almost never warrant rabies post-exposure treatment. However, if there are unusual circumstances surrounding the bite incident, such as bizarre animal behavior, consult the Bureau of Health Division of Disease Control at 287-8773, or (800) 821-5821, for assistance in risk assessment and treatment recommendations.

Healthy caged rodents (such as hamsters, gerbils, rats and mice) and rabbits which have been caged exclusively indoors for the past six months or more and which have not been exposed to any potentially rabid animal pose no risk. Treatment would not be recommended for the exposed human.

Rodents and rabbits, which have been caged or kept outdoors, may possibly be exposed to free roaming rabid animals. If a human is exposed to rabies by a rodent or rabbit caged or kept outdoors, submitting the animal for testing must be considered; the Bureau of Health should be consulted. Domesticated rodents and rabbits showing behavioral changes or neurological impairment should be examined by a veterinarian to determine if rabies testing is indicated.

From 1985 through 1994, 86% of the 368 cases of rodent rabies occurring in the U.S were in woodchucks. In states reporting raccoon rabies, woodchucks have tested positive for rabies more frequently than other rodents in the current epizootic in the northeast. In 1997, the Maine HETL identified 7 woodchucks as positive for rabies. Exposure to a woodchuck should, therefore, be treated as with other high-risk species.

### **Bats**

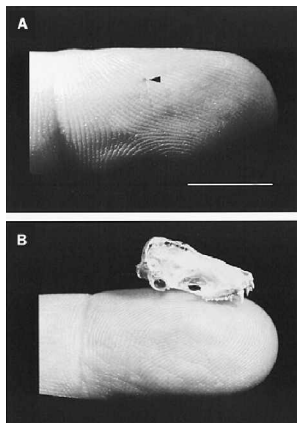
As bats have been implicated in the transmission of the majority of human rabies in the United States, they merit a separate discussion. First, determine if there is any possibility that human or domestic animal contact with the bat has occurred. Contact would include:

- a bite, scratch, or other direct contact with the bat through a break in the skin or through the mucous membranes of the eyes, nose or mouth.
- a bat has been in close proximity to an unattended young child, or a sleeping or impaired person.
- a bat is found in a room with an unattended pet.
- a pet, usually a cat or dog, is found carrying a live or dead bat in its mouth.



If such possibilities cannot be ruled out, the bat should be captured for rabies testing. Only animal control officers, game wardens, or pest management personnel should capture live bats. If a citizen must capture a bat that may need to be tested for rabies, the following technique should be utilized (**damaging the bat's head should be avoided as it may prevent a rabies testing from being performed**): 1) use caution and avoid direct contact with the bat; wear leather gloves if possible, 2) wait until it lands, and then cover it with a small box, coffee can, or other container; 3) slip a piece of cardboard under the container, thus trapping the bat, 4) secure the bat by taping the cardboard tightly to the container, 5) wash your hands with soap and water, and 6) call your local animal control officer, game warden, or pest management personnel to assist in arranging for rabies testing of the bat at the State's Health and Environmental Testing Laboratories in Augusta. **See Appendix H for a detailed discussion on capturing bats and bat exclusion methods.**

REMEMBER, IF THERE IS POSSIBILITY OF HUMAN OR PET CONTACT, **CAPTURE THE BAT** AND ARRANGE TO HAVE IT TESTED FOR RABIES. BATS HAVE VERY SMALL AND VERY SHARP TEETH, AND A BAT BITE MAY BE EXTREMELY DIFFICULT TO DETECT; BELOW IS A PICTURE OF A BAT BITE WHICH ILLUSTRATES THIS.



**Fig. 2a.** Puncture wound on a finger from the bite of a silver-haired bat (a black arrow is pointing at the bite wound).

**Fig. 2b.** Skull of a silver-haired bat on a finger.

*Reprinted with permission from Elsevier  
(The Lancet, 2001, Vol 357, No 9269, pg 1714),  
courtesy of Alan C. Jackson.*

**If it is suspected that a bat had close contact with a human and the bat could not be captured for testing, rabies treatment will be recommended if possible contact has taken place. Domestic vaccinated animals will receive a booster dose of vaccine, unvaccinated pets will need to be euthanized or quarantined for 6 months.**

If you have confirmed there was no possibility of human or domestic animal contact with the bat, it can be allowed to leave on its own - close the room and closet doors, open windows, turn on a light and observe the bat until it leaves.

## **Wildlife Hybrids**

### ***Vaccination***

There is no rabies vaccine licensed for use in wild animals crossbred to domesticated animals, including wolf hybrids. There have been no scientific studies to show that canine rabies vaccine

will prevent rabies infection in a wolf hybrid. It is UNKNOWN if vaccinating a wolf hybrid for rabies provides protection or simply a false sense of security.

The IF&W currently regards wildlife hybrids as “domesticated animals,” therefore they fall under state dog regulations and must be licensed. However, since there is no vaccine approved for wildlife hybrids, veterinarians and owners must make an individual decision on whether to inoculate these animals against rabies. The American Veterinary Medical Association strongly advises that all veterinarians require a client to sign an “informed consent” release form before vaccinating a wildlife hybrid. **EVEN IF A HYBRID ANIMAL IS VACCINATED, IT WILL NOT BE CONSIDERED IMMUNIZED IN THE EVENT IT IS INVOLVED IN A POSSIBLE EXPOSURE INCIDENT.**

#### ***Wildlife Hybrids Which Expose Humans or Show Signs of Rabies***

As with other wild animals, the length of time required for a wildlife hybrid to start showing signs of rabies after it becomes exposed (the incubation period) is unknown. Therefore, in the event of a human or domestic animal exposure, wildlife hybrids, whether vaccinated or not, will be euthanized and tested for rabies. As with other situations involving animals which potentially expose a human to rabies, the Bureau of Health should be consulted.

#### ***Wildlife Hybrids Biting Domesticated Animals***

A wildlife hybrid which bites a domesticated animal will be euthanized and tested for rabies if recommended by the Bureau of Health.

#### **Wild Animals**

Wild mammals (skunks, foxes, coyotes, raccoons, bobcats) and bats are considered most likely to be involved in the transmission of rabies, and are considered the cause of most indigenous cases of human rabies in the United States since 1960. *A bite from a wild mammal, or any type of direct contact with a live bat is considered a serious event.* Every attempt should be made to apprehend the animal and submit the brain tissue for rabies testing.

**If the animal is available for testing, it is not necessary to begin rabies post-exposure treatment unless the laboratory results indicate the animal is rabid.** In cases where the animal is under the care of a wildlife rehabilitator, in a zoo, or being kept with a permit, the disposition of the animal should be determined by the Bureau of Health following a standard bite investigation. When a wild animal is unavailable for rabies testing, consultation with an epidemiologist regarding recommendations for rabies post-exposure treatment may be obtained by calling the Division of Disease Control at 287-8773, or (800) 821-5821.

Direct contact between wild animals and humans or their domesticated animals which could lead to potential rabies infection is uncommon. Such contact that **does** occur should be treated as a potential rabies exposure.

Common indications of rabid wildlife include any or all of the following: absence of fear, matted fur, discharge from eyes or nose, incoordination. Bats, raccoons, foxes, and skunks are more likely to carry rabies. Young (newborn) of these animals may contain the rabies virus and could transmit the virus to handlers. Feeding, relocating, or other handling of any wildlife without specific permits or licenses is strongly discouraged or prohibited by law. Department of Inland Fisheries and Wildlife is responsible for the management and protection of wildlife

resources in Maine, including the possession, transportation, rehabilitation or destruction of wild animals. Game wardens have specific responsibilities relating to rabies incidents involving wild animals. Registered animal damage control cooperators are available to assist the Department of Inland Fisheries and Wildlife.

Emergencies, including possible or potential rabies exposure to humans or pets should be reported to Wardens or State Police. An official will respond as rapidly as possible and carry out the necessary functions to protect people, capture or destroy a wild animal, and ensure that proper handling and testing is performed. However, if an official response is delayed, or in the absence of a Game Warden, emergency removal of injured or ill wildlife may be carried out by an ACO, wildlife rehabilitator, registered animal damage control cooperator, police officer or other responsible and qualified individual on the scene. The action must be reported to the warden service.

Registered animal damage control cooperators and licensed wildlife rehabilitators are not employees of the IF&W, and are under no obligation to respond; they may charge a fee for services. Fees charged for approved services relating to rabid wildlife may be paid by IF&W. Generally such an agreement must be approved beforehand. For the names and addresses of the registered animal damage control cooperators and licensed wildlife rehabilitators in your area contact your local game warden or see the contact numbers in the beginning of this manual. For more information, see sections on Rabies Risk Reduction and Responding to Human Exposure.

**Table 5: MANAGEMENT OF ANIMALS THAT EXPOSE HUMANS TO RABIES**

Type of Animal	Action Taken
<b>High risk wildlife species</b> (bat, fox, raccoon, skunk, woodchuck, etc.)  <b>Wildlife Hybrid</b> (incl. wolf-hybrids)	Capture animal and submit to the HETL for emergency rabies testing if a bite was inflicted; otherwise submit for routine testing.
<b>Domestic animal</b> (dog, cat, ferret, horse, cattle, sheep, goat, swine, etc.) <b>with signs suggestive of rabies</b>	Capture animal and submit to the HETL for emergency rabies testing if a bite was inflicted; otherwise submit for routine testing.
<b>Other wild mammals</b> (exotics, deer, etc.)	Call the Division of Disease Control at 287-8773, or (800) 821-5821, for guidance.
<b>Dogs, cats, and ferrets acting normally</b>	Capture and quarantine the animal for 10 days. If the animal is euthanized or dies during this quarantine period, it <b>must</b> be tested for rabies.
<b>Domestic animal</b> (horse, goat, sheep, cattle, swine, etc.) <b>acting normally</b>	Call the Division of Disease Control at 287-8773, or (800) 821-5821, for guidance.
<b>Small rodents</b> (mice, rats, hamsters, gerbils, squirrels, chipmunks, moles, voles, etc.) <b>or rabbits</b>	Neither quarantine or testing of animal needed unless there are special circumstances (see p.29 of the text).

# MANAGEMENT OF ANIMALS EXPOSED TO RABIES

**ANY ANIMAL POTENTIALLY EXPOSED TO RABIES VIRUS BY A WILD, CARNIVOROUS MAMMAL OR A BAT THAT IS NOT AVAILABLE FOR TESTING SHOULD BE REGARDED AS HAVING BEEN EXPOSED TO RABIES.**

## **Dogs, Cats, and Ferrets Currently Vaccinated**

When a currently vaccinated dog, cat or ferret is exposed to a rabid or suspect rabid animal, **revaccinate as soon as possible after exposure**, and quarantine the animal at its owner's property for 45 days. This quarantine period is necessary because no vaccine is 100% effective, and therefore, it is possible for a vaccinated animal to contract rabies. Because rabies is most likely to become apparent within 1-45 days after exposure, this quarantine period is set at 45 days.

## ***Not Vaccinated or Past-Due on Rabies Vaccination***

When a dog, cat or ferret without current rabies immunization is known or suspected to be exposed to a rabid or suspect rabid animal, it should be immediately euthanized and disposed of. IF the owner is unwilling to have the animal euthanized, it should be placed in strict quarantine for six months at an *approved* facility. **Rabies vaccine should be administered upon entry into quarantine OR one month prior to release.** If give at the start of the quarantine period, this vaccination does NOT serve as post-exposure prophylaxis for the animal, but may provide protection in the event of another exposure occurring during the quarantine period.

This situation is of the greatest concern to public health officials because of the much greater possibility that a domesticated animal will come down with rabies if it is unimmunized. Although one would expect onset of illness within 45 days, there have been documented cases where this has occurred in unimmunized pets 5-6 months after exposure. Accordingly, this period of strict quarantine is set at six months to cover all expected possibilities.

## ***Quarantine Conditions***

The **dog, cat, or ferret:**

- a. Must be kept on the owner's premises in an escape-proof building or enclosure (house, garage, etc.) at the responsibility of an adult owner/keeper under the supervision of the local ACO, or in a state licensed boarding kennel or veterinary clinic;
- b. May not be allowed to run at large, or left outside unsupervised where it may come in contact with other animals, as in a fenced yard or on a chain;
- c. Can only be off the owner's property under the immediate control of an adult owner/keeper, meaning on a leash or in a carrier or appropriate animal crate;
- d. Should not be permitted to have contact with other animals or people;
- e. If quarantined at home, cannot be off the owner's property unless being taken to a veterinary hospital for examination or euthanasia.

- f. If the animal shows any changes in health or behavior, it must be examined by a veterinarian, who will determine if rabies testing is indicated.
- g. If the animal escapes, notify the local ACO immediately.
- h. Do not sell, give away, euthanize or otherwise dispose of the animal during the quarantine period without prior permission from the ACO.
- i. Animals must be examined by a veterinarian at the end of the quarantine period.

Veterinarians or animal owners with questions on how to properly manage pets exposed to a skunk, bat, or a suspiciously acting carnivore that is unavailable for rabies testing should contact the Bureau of Health Division of Disease Control at 287-8773, or (800) 821-5821.

**Table 6: MANAGEMENT OF DOGS, CATS, AND FERRETS EXPOSED TO RABIES**

Exposure Category	Vaccinated <sup>+</sup>	Non-Vaccinated <sup>§</sup>
Direct contact or visible bite from <b>known</b> rabid animal	1. Booster immediately* 2. Notify ACO 3. Quarantine and observation for 45 days	1. <b>EUTHANIZE</b> 2. If owner unwilling: a. Notify ACO b. Quarantine for 6 months c. Vaccinate on entry or 1 month before release
Direct contact with or visible bite or wound from <b>suspect</b> rabid animal (unavailable for testing)	1. Booster immediately* 2. Notify ACO 3. Quarantine and observation for 45 days	1. <b>EUTHANIZE</b> 2. If owner unwilling: a. Notify ACO b. Quarantine for 6 months c. Vaccinate on entry or 1 month before release
Wound of unknown origin: <b>suspicious</b> scratch, bite, abscess or wound	1. Booster immediately* 2. Notify ACO 3. Quarantine and observation for 45 days	1. <b>EUTHANIZE</b> 2. If owner unwilling: a. Notify ACO b. Quarantine for 6 months c. Vaccinate on entry or 1 month before release
Exposure by proximity (seen near or in same vicinity of known rabid animal) - <b>no contact</b> or wounds	1. Consider booster* 2. <b>Observation</b> for 45 days	1. Vaccinate at once 2. <b>Observation</b> for 6 months

\*If most recent rabies vaccination was given within 1 month, it is not necessary to re-vaccinate.

<sup>+</sup> **Currently vaccinated animals:** animals are considered currently vaccinated for rabies if at least 30 days has elapsed since the initial vaccination, and the duration of vaccination has not exceeded the time period recommended for that species and brand of vaccine.

<sup>§</sup> **Unvaccinated animals:** An unvaccinated animal is defined as: an animal with no previous rabies vaccination, one whose first vaccination was given within the last 30 days, one whose last vaccination has expired (per vaccine manufacturer's recommendations), or no approved vaccine exists for the species.

**Always wear gloves when handling saliva-contaminated wounds or fur.**

**Always advise owner of rabies risk.**

**Always record any potential rabies contact case.**

## **Livestock**

The Maine State Department of Agriculture, at 287-3701, will manage all cases of livestock exposed to potentially rabid animals. Remember that **ANY ANIMAL POTENTIALLY EXPOSED TO RABIES VIRUS BY A WILD, CARNIVOROUS MAMMAL OR A BAT THAT IS NOT AVAILABLE FOR TESTING SHOULD BE REGARDED AS HAVING BEEN EXPOSED TO RABIES.** All livestock rabies exposures must be reported to the Maine State Department of Agriculture, and the ACO of that town. The decision on how to handle exposed livestock will be based on the likelihood of rabies in the animal or herd.

All mammalian species of livestock are susceptible to rabies, with cattle and horses among the most frequently infected of all livestock. Horses or livestock animals currently vaccinated with a rabies vaccine approved for that species and exposed to a rabid animal should be revaccinated as soon as possible and quarantined for 45 days. Unvaccinated livestock should be slaughtered immediately. If the owner is unwilling to have this done, the exposed animal can be quarantined for 6 months; any illness in the quarantined animal should be reported immediately. Animals maintained in USDA licensed research facilities or accredited zoological parks should be evaluated on a case-by-case basis. Owned exotic animals/livestock bitten by a rabid animal will likely be subject to euthanasia. Rare or threatened animal species will be evaluated on a case-by-case basis.

The following are **recommendations** for owners of livestock exposed to rabid animals:

- (1) If the animal is slaughtered within 7 days of being bitten, its tissues may be eaten without risk of infection, provided that liberal portions of the exposed area are discarded. Federal guidelines for meat inspectors require that any animal known to have been exposed to rabies within 8 months be rejected for slaughter.
- (2) As a precaution, neither tissues nor milk from a rabid animal should be used for human or animal consumption. Pasteurization temperatures will inactivate rabies virus; therefore, if someone drinks pasteurized milk or eats cooked meat, it does not constitute a rabies exposure.
- (3) Having more than one rabid animal in a herd or having herbivore-to-herbivore transmission is uncommon; therefore, restricting the rest of the herd if a single animal has been exposed to or infected by rabies might not be necessary.
- (4) No animal may be slaughtered within 21 days of rabies vaccination.

## ***Signs of Rabies in Livestock***

### ***Cattle***

The signs of rabies in cattle vary, but some of the following will be found in virtually all animals:

1. Straining and repeated efforts to urinate or defecate; the signs may be confused with the typical straining seen at calving.
2. Paralysis, often starting in the hindquarters, very often in one leg only, with a typical knuckling of the fetlock joint.
3. Loss of appetite and the abrupt cessation of lactation often confused with an intestinal disturbance such as impaction of the rumen or rectum.

4. Because of developing paralysis, animals may appear to be “choked,” under no circumstances should anyone put their hands in the oral cavity of these animals in an attempt to examine or medicate.
  5. Altered facial expression, a very tense alert appearance, and the bells of the ears thrown forward. The eyes are wide open, follow any moving object with a fixed stare.
  6. Bellowing is common. The head is extended, the back arched, the flanks tucked in, and a hoarse, sometimes high-pitched bellow is emitted.
  7. Salivation occurs in less than half the animals affected, and is usually seen as a drooling from the mouth rather than profuse salivation.
- Rabies in livestock may also produce increased sexual excitement, especially in cattle, with bulls attempting to mount inanimate objects.

### *Horses*

Infected horses exhibit obvious behavioral changes, the majority showing signs of dullness and depression more often than excitement or mania. Frequently, horses become recumbent and wildly scramble and thrash, or appear paralyzed. Death rapidly follows within three to five days of the onset of clinical signs.

### *Pigs*

Pigs may show excitement and a tendency to attack, or dullness and incoordination. Affected sows may show twitching of the nose, rapid chewing movements, excessive salivation and convulsions.

### *Sheep*

Rabies may occur in several animals in a sheep flock, since they are more easily bitten by rabid carriers (skunks, foxes and dogs), but may show the onset of symptoms at different times.

### ***Livestock Vaccination***

There are vaccines available for horses, sheep and cattle. They can be vaccinated as soon as three months of age, and revaccinated in accordance with vaccine manufacturer's recommendations.

According to the Compendium of Animal Rabies Control it is neither economically feasible nor justified from a public health standpoint to vaccinate all livestock against rabies. However, consideration should be given to the vaccination of certain livestock, especially animals which are particularly valuable and/or may have frequent contact with humans, or which are kept in areas where wildlife rabies is known to exist. A licensed veterinarian should be consulted on the advisability of livestock vaccination. Maine Dept. of Agriculture, Animal Health and Industry, phone number 287-3701, can also provide information on vaccines for specific species.

The following definitions should aid in assessing the vaccination status of livestock. In all cases, animals are considered vaccinated only if vaccinated by a licensed veterinarian or vaccinated under the direct supervision of a licensed veterinarian. Records must be signed by the licensed veterinarian, and must include the date of vaccination, the type of vaccine used, and the animal identification. Metal ear tags are considered positive identification for livestock. Positive identification for horses might be a drawn picture similar to a Coggins test chart, a photograph, a tattoo or a veterinarian's record. T.B. test chart or similar form may be used for this record

keeping. A veterinarian's record may be more practical for individual animals. The State provides an official vaccination certificate on request.

### *Currently vaccinated*

Animals are considered currently vaccinated for rabies if at least 30 days has elapsed since the initial vaccination, and the duration of vaccination has not exceeded the time period recommended for that species and brand of vaccine.

### *Unvaccinated*

Animals are considered unvaccinated if:

1. No approved vaccine exists for the species (see Compendium of Animal Rabies Control).
2. The animals are vaccinated by someone other than a licensed veterinarian in accordance with the requirement above.
3. The vaccination is not within the time frame listed above.

**Table 7: MANAGEMENT OF LIVESTOCK EXPOSED TO RABIES**

Exposure Category	Vaccinated <sup>†</sup>	Non-Vaccinated <sup>‡</sup>
Direct contact or visible bite from <b>known</b> rabid animal	<ol style="list-style-type: none"> <li>1. Booster immediately*</li> <li>2. Notify ACO</li> <li>3. Quarantine and observation for 45 days</li> </ol>	<ol style="list-style-type: none"> <li>1. <b>EUTHANIZE</b></li> <li>2. If owner unwilling: <ol style="list-style-type: none"> <li>a. Notify ACO</li> <li>b. Quarantine for 6 months</li> <li>c. Consider vaccination on entry or 1 month before release</li> </ol> </li> </ol>
Direct contact with or visible bite or wound from <b>suspect</b> rabid animal (unavailable for testing)	<ol style="list-style-type: none"> <li>1. Booster immediately*</li> <li>2. Notify ACO</li> <li>3. Quarantine and observation for 45 days</li> </ol>	<ol style="list-style-type: none"> <li>1. <b>EUTHANIZE</b></li> <li>2. If owner unwilling: <ol style="list-style-type: none"> <li>a. Notify ACO</li> <li>b. Quarantine for 6 months</li> <li>c. Consider vaccination on entry or 1 month before release</li> </ol> </li> </ol>
Wound of unknown origin: <b>suspicious</b> scratch, bite, abscess or wound	<ol style="list-style-type: none"> <li>1. Booster immediately*</li> <li>2. Notify ACO</li> <li>3. Quarantine and observation for 45 days</li> </ol>	<ol style="list-style-type: none"> <li>1. <b>EUTHANIZE</b></li> <li>2. If owner unwilling: <ol style="list-style-type: none"> <li>a. Notify ACO</li> <li>b. Quarantine for 6 months</li> <li>c. Consider vaccination on entry or 1 month before release</li> </ol> </li> </ol>
Exposure by proximity (seen near or in same vicinity of known rabid animal) - <b>no contact</b> or wounds	<ol style="list-style-type: none"> <li>1. Consider booster*</li> <li>2. <b>Observation</b> for 45 days</li> </ol>	<ol style="list-style-type: none"> <li>1. Vaccinate at once</li> <li>2. <b>Observation</b> for 6 months</li> </ol>

\*If most recent rabies vaccination was given within 1 month, it is not necessary to re-vaccinate.

<sup>†</sup>**Currently vaccinated animals:** animals are considered currently vaccinated for rabies if at least 30 days has elapsed since the initial vaccination, and the duration of vaccination has not exceeded the time period recommended for that species and brand of vaccine.

<sup>‡</sup>**Unvaccinated animals:** An unvaccinated animal is defined as: an animal with no previous rabies vaccination, one whose first vaccination was given within the last 30 days, one whose last vaccination has expired (per vaccine manufacturer's recommendations), or no approved vaccine exists for the species.

**Always wear gloves when handling saliva-contaminated wounds or fur.**

**Always advise owner of rabies risk, and always RECORD any potential rabies contact case.**



### **Livestock in quarantine:**

The animal should be quarantined in a secure stall or pen apart from other animals for 45 days. Maine Dept. of Agriculture, Division of Animal Health and Industry, phone number 287-3701, must give permission to move the animal from the farm. Quarantine is the responsibility of the owner, and the owner assumes all associated risks. The ACO may monitor the quarantine.

If an animal exhibits abnormal behavior at any time during quarantine, a veterinarian should examine the animal. If it is determined to be showing signs of rabies, the veterinarian should decapitate the animal and submit the head for rabies testing. Any animal that dies of unknown causes during the quarantine period should also be considered for rabies testing. Milk from the animal should only be used if pasteurized. Raw milk should not be used for the duration of the quarantine.

An animal in quarantine should not be sold, given away, euthanized or otherwise disposed of without prior permission from the Maine Dept. of Agriculture. With permission, it can only be sold (including for slaughter) if not exhibiting signs of rabies, and then the buyer must be made aware that the animal is under rabies observation. The Maine Dept. of Agriculture, Animal Health and Industry, must give permission to move these animals from the farm.

**Liability:** Any expenses incurred due to rabies exposure of livestock (including decapitation, transportation, and quarantine) are the responsibility of the owner.

### **Rodents and Lagomorphs (Rabbits)**

No rabies vaccine is licensed for use in wild or domesticated rodents (squirrels, hamsters, guinea pigs, chipmunks, gerbils, rats and mice) or lagomorphs (rabbits and hares). If housed outdoors, wire areas should be double-walled to prevent wild animals from reaching through the wire. In the mid-Atlantic epizootic, a small number of rodents and lagomorphs (rabbits and hares) are found each year to be rabid. If these animals are themselves exposed to a rabid or suspect rabid animal, they should be euthanized.

### **Wildlife and Wildlife Hybrids**

All wild animals (including wildlife hybrids) exposed to rabies must be euthanized immediately, whether vaccinated or not. The Bureau of Health Division of Disease Control at 287-8773, or (800) 821-5821, should be consulted if guidance is needed.

### ***Wildlife hybrids biting domesticated animals***

A wildlife hybrid, which bites a domesticated animal, will be euthanized and tested for rabies if recommended by the Bureau of Health Division of Disease Control.

## **FORMULATION OF RABIES PREVENTION POLICIES IN ANIMAL FACILITIES**

All facilities and people which handle animals including veterinary hospitals, animal shelters and humane societies, animal control officers, wildlife rehabilitators, animal damage control trappers and boarding kennels, should become familiar with rabies issues, and develop local or in-house protocols on how to handle rabies related situations using the *Rabies Management Guidelines*. Animal control officers, veterinary hospitals, animal shelters and humane societies are usually the first to become involved in a potential rabies situation. Establishing policies to deal with that first rabies suspect will allow the situation to be handled safely and professionally.

Public education is the key to reducing the risk of rabies among domesticated animals and humans. Animal care facilities and animal control officers have the opportunity and the responsibility to see that accurate information is presented to the public. Staff should have the knowledge to respond quickly and appropriately in a rabies situation, either by giving the public direct information, or by referring them to the appropriate professionals for assistance.

The following points should help those who work with animals to formulate a rabies plan for their facility:

### **Plan ahead**

It is very useful to make arrangements, before there is an emergency, with animal control officers, animal shelters and humane societies, veterinarians, town officials, police departments, sheriff's departments, game wardens, wildlife rehabilitators, animal damage control trappers and courier services, all of whom may become involved in reporting, catching, destroying, decapitating, transporting and/or sheltering animals. Local police departments are a vital group since they are often called on in emergency situations involving suspect rabid animals. It is critical that police officers and others not normally involved in handling animals, be instructed in the appropriate way to handle suspect animals, including when and where it is and is not suitable to shoot an animal. Familiarity with local game wardens and emergency response procedures is helpful. It is important to decide how your facility will handle situations involving animals other than dogs, cats, and ferrets. Wild animals are dealt with very differently in regards to rabies exposures than are dogs, cats and ferrets.

### **Educate the staff**

Everyone, including animal control officers, all facility staff members, volunteers, and board members should become familiar with animal handling protocols and/or this Rabies Management Manual and the procedures it outlines. The staff should be able to deal calmly and effectively with the public to dispel fears and give accurate information.

### **Post a contact list**

A contact list, like the one at the beginning of this manual, should be posted near each telephone with routine and emergency numbers of the local and state officials and agencies that are involved in handling rabies situations.

### **Establish a human pre-exposure vaccination policy**

All animal control officers, animal shelter and humane society employees, veterinary hospital staff, wildlife rehabilitators, and any other high-risk personnel should seriously consider receiving pre-exposure vaccination. Each staff member should be informed of the availability of immunization, and should then talk to their health care provider to discuss the details of the procedure. Management of the animal facility may want to consider having staff members sign a statement attesting to the fact that pre-exposure vaccination has been discussed, with signed agreement or refusal. Periodic serologic testing and/or booster immunizations according to the employee's risk category must also be considered (see pages 13-15).

### **Establish a human post-exposure policy**

If a staff member is bitten by a suspect animal, the wounds must be flushed immediately and washed thoroughly with soap and water, and a health care provider must be contacted at once. The necessity for post-exposure rabies treatment or animal quarantine will be decided on a case by case basis by the attending physician and the DHS. Note that staff members at an animal facility cannot legally give any advice to another staff person or the public on treating human bite wounds or exposures to rabies; this must be left to a physician. It is important to keep accurate records of all human and domesticated animal exposures which occur in your facility, or which are reported to your staff. Many animal facilities are using some type of rabies exposure log where incidents can be recorded for later follow-up.

### **Establish a pet pre-exposure vaccination policy**

All rabies vaccinations for cats, dogs and ferrets must be administered by a veterinarian. This is state law and the only way to assure the public that the pet has been properly vaccinated. One month after an initial vaccination, a peak rabies antibody titer is reached and the pet can be considered to be currently immunized. Pets which are maintained on a proper re-immunization schedule may be considered to be currently immunized directly after a booster dose. It is important to question the vaccination status of all animals, in order to advise on an immunization schedule, or to add rabies to the differential diagnosis if the animal is showing signs of illness. Note that immunosuppressed or ill animals may not be able to mount an adequate immune response to vaccination. Veterinarians may want to vaccinate some animals more frequently and avoid giving corticosteroids concurrently with rabies vaccine.

### **Establish a policy on pets exposed to rabies**

Veterinary hospitals should establish protocols for handling pets exposed to known or suspected rabid domesticated animals or wildlife. Again, keeping records of these exposures in a separate log is a good idea.

Animal facilities and animal control officers face the problem of how to safely treat a pet with an abscess or bite wound of unknown origin, once rabies is in the area. The following points will help in these situations:

- a. **Be extremely cautious and wear gloves when handling animals with suspicious wounds.** The wounds of these animals may contain viable rabies virus from the saliva of the infected animal. Gloves should be worn when handling these animals, especially if it is within 2 hours of the incident. Owners handling such animals (especially if they have done so directly after the wounds were sustained) should wash with soap and water at once and be referred to their health care provider.
- b. **Determine if an injured pet has bitten anyone.** If so, the local animal control officer must be notified. In most cases these pets will be quarantined for a period of 10 days.
- c. **The animal's owner must be advised** of their pet's potential exposure to rabies, and referred to their health care provider.
- d. **Long-term quarantine** (45 days - 6 months) is necessary for dogs, cats and ferrets which have been exposed to rabies. Individual animal facilities must decide whether they are willing to provide this kind of care for owners who can't confine pets at home. Protocol would be similar to that for quarantine of biting animals.

#### **Establish a policy for pets showing signs of rabies**

Proper handling of suspect animals is essential to insure the safety of the public and the person handling the animal. Dogs, cats and ferrets which bite humans must be quarantined for 10 days. Each facility will need to establish policies for handling quarantined animals. Animals, which show signs of rabies (behavioral changes or neurological signs), should be evaluated by a veterinarian for possible rabies testing.

#### **Establish a stray animal placement policy**

See the section on "Municipalities' Responsibilities to Animal Control" on page 8, and the "Animal Shelter Adoption Disclaimer" in Appendix D. Animal shelters and municipalities should work together to formulate a policy.

#### **Quarantine guidelines for animal facilities**

1. Quarantine nothing unless you can be sure of safely and humanely confining the suspect animal. Escape must not be a possibility.
2. Ideally, quarantined animals should be kept in cages that are divided by guillotine-type doors, so one side may be cleaned while the animal is moved without handling to the other side. If this isn't possible, handling must be minimal and should be by one or two staff people (preferably who have had pre-exposure vaccination) using appropriate equipment (gloves, restraint poles, squeeze bars, etc.). Records should be kept of all staff persons who have contact with the animal.
3. Quarantined animals should not be accessible to the public. Cages should be clearly marked with rabies warnings in red, orange or neon. Cages should be kept locked.

4. Solid walls should separate quarantined animals from other animals. **Animals must not be able to touch other animals, and saliva must not be able to reach other cages or runs.**
5. Cages, dishes, and litter pans must be in good condition so they can be easily disinfected every day. Disinfection can be with alcohol (40-70% ethanol), freshly prepared bleach solution (1/2 cup per gallon water), iodine (25 ppm) or quaternary ammonium (200 ppm) compounds.
6. Quarantined animals should be observed carefully several times daily for signs of illness or behavior changes. If any changes occur, the animal should be immediately examined by a veterinarian to determine if euthanasia and rabies testing are necessary.

# RABIES TESTING

In the State of Maine, the only accepted confirmation of rabies in an animal is the Direct Fluorescent Antibody (DFA) of brain tissue. The test is a rapid, sensitive, and reproducible laboratory method for detecting rabies antigen in tissue. Fresh brain tissue is required. Do not fix samples in formalin.

The following guidelines will help in preparing and submitting specimens to the Health and Environmental Testing Laboratory (HETL) in Augusta, Maine, where the testing is done. It should be emphasized that when rabies testing is necessary, speed is very important, and a health professional should be consulted early in any potential rabies situation. The decision to submit an animal for rabies testing will ultimately be made by the attending physician (when a human is exposed) or veterinarian (when a domesticated animal is exposed), and by the professionals at the HETL.

## Testing Criteria

The HETL will accept specimens for rabies testing which meet the following guidelines:

1. An animal under rabies suspicion which has exposed a human; or
2. An animal under rabies suspicion which has exposed a domesticated animal.
3. Surveillance testing must be approved prior to submission and limited to raccoons, skunks, foxes, and woodchucks from areas where wildlife rabies has not yet been found and is in close proximity to an epizootic area.

## Type of Specimen to Submit

1. The HETL does not accept live animals (bats are the only exception).
2. All animals, except bats, should be decapitated by veterinarians or trained personnel before being submitted to the HETL. The HETL does not have facilities to process carcasses and they will not be accepted or tested. If a bat is submitted for testing, the entire body may be submitted.

## Safe Handling of Specimens

1. Specimens (bodies or heads) should always be handled with waterproof gloves.
2. Specimens must be stored and transported in a proper container so that fluid leakage is prevented.
3. Specimen containers must be clearly labeled "Rabies Suspect."
4. To clean surfaces and items contaminated by a rabies suspect, use a bleach solution (1/2 cup per gallon of water) as a disinfectant.

If a specimen cannot be sent to the HETL immediately, it should be refrigerated. It is important that the brain tissue does not degenerate. **A specimen must not be frozen.** However, if freezing has occurred, it should be kept frozen and submitted that way to the HETL. The HETL has a better chance of getting testable tissue if they thaw it there.

## Proper Specimen Packaging

1. Place in a watertight container (well tied, heavy plastic bag or a plastic pail/metal can with tight fitting lid).

2. This container should be placed in a second, larger, waterproof container. If plastic bags are used for both layers, the specimen should then be boxed for more support, easier handling, and labeling.
3. Immediately before transport, the space between the two watertight containers should be packed with ice packs, or crushed ice if packs are not available. The ice or ice packs should not be directly in contact with the specimen to avoid freezing it.
4. A “Rabies Submission” form should be completely filled out and attached securely to the outside of the packaging. It is suggested that a copy of this form be kept for future reference by those submitting the specimen. (See sample form in the Appendix.)
5. If the animal exposed a human, the completed bite report should be submitted with animal.

### **Transport and Delivery of Specimens**

The HETL should always be called before the transport/delivery of a specimen for testing. The HETL is located at 221 State Street, Augusta, Maine 04333.

During **regular hours** (Monday to Friday, 7:00 a.m. to 5:00 p.m.), call 287-2727. When delivering after hours, use the phone just inside the front door of the building to call security for admittance (287-4154).

### **BE PREPARED- SET UP YOUR TRANSPORTATION SYSTEM BEFORE IT BECOMES AN EMERGENCY**

The responsibility for transporting specimens related to human rabies exposure belongs with the owner of the animal (if known), with the town if the animal is a stray, with the Warden Service if it's wild, or with the family of the bitten person. For situations where a domesticated animal has been exposed, the animal's owner is responsible for transporting the specimen for testing. *Professionals involved in the specific case, whether an animal control officer, animal shelter or veterinarian have a responsibility to help with coordinating transport.*

The Department of Environmental Protection considers the transporting of suspected rabid animals as “**Clinical Specimens**,” not hazardous waste. Below are specimen transportation options; this is not a complete list and some transporting companies listed do not service all areas in Maine.

#### **OPTION 1:**

An animal control officer or someone designated by the animal control officer will transport the clinical specimen personally to the HETL.

Undomesticated animals only: A game warden will arrange transport of the specimen to the HETL.

#### **OPTION 2:**

For rural areas: an animal control officer or someone designated by the animal control officer will transport the specimen to an area for pick-up by a delivery service.

**OPTION 3:**

Call a delivery service for a guaranteed delivery time and date.

- Greyhound: Check local yellow pages under “Bus Lines”
- Maine Delivery Service: 1-800-540-7270, 784-7277, and 783-8379, Minot Avenue, Auburn, Maine 04210
- Roadway Package System (RAPS): 1-800-762-3725, PO Box 108, Pittsburgh, PA 15230
- General Courier: 1-800-698-5035, PO Box 1072, Portland, Maine 04104
- Bits & Pieces Delivery & Courier Service: 1-800-234-5594, 226 Anderson Road, Portland, Maine, Augusta location: 623-9022
- L A Xpress: 1-800-287-2343; Auburn, Lewiston location: 784-1997
- Maine Xpress Couriers: 1-800-439-2841, 11 Liberty Drive, Bangor Maine

The following are delivery services that may **NOT** transport clinical specimens, but they are worth a try as some have reportedly been used successfully at times: Fed Ex, UPS-United Parcel Service, Express Mail-U.S. Postal Service

**PLEASE NOTE:** Skunks and other animals which are saturated with skunk spray have been brought to the lab for rabies testing, and the pungent odor has permeated the building when left overnight in the inside refrigerator. This has resulted in numerous complaints throughout the Department of Human Services building. To rectify this problem, an enclosed refrigerator has been placed outside the lab entrance door for storing after-hours skunk specimens. **The HETL still prefers that all skunks be decapitated and tightly secured in plastic bagging before being dropped off at the laboratory.**



## **SPECIMEN PREPARATION (DECAPITATION)**

When an animal must be rabies tested, decapitation must be performed by a veterinarian, trained personnel, or trained game warden so that the head alone can be submitted to the HETL. All personnel trained to decapitate receive the pre-exposure rabies vaccine.

There has never been a case of human rabies associated with an exposure received during decapitation; however, caution must be taken as the brain, spinal cord, salivary glands and saliva of the animal may contain rabies virus that could possibly cause rabies if splashed onto an open cut or mucous membrane. It is therefore extremely important for the veterinarian as well as any assistants and observers to wear protective gear and exercise caution with the use of sharp objects used during the procedure.

If exposure does occur during this process, it must be noted on the laboratory submission form for the animal. If the animal tests positive for rabies, a physician should be consulted as soon as possible concerning the need for rabies post-exposure treatment for the person involved.

### **Protective clothing and equipment**

1. heavyweight autopsy gloves;
2. full face shield;
3. protective covering for clothing: surgical gown, plastic apron, coveralls, etc.;
4. plastic sheet or body bag to protect surfaces and catch body fluids if procedure can't be performed in a tub.

It is recommended that decapitation be performed in a tub or other easily disinfected area, where body fluids and cleaning solutions can be safely drained away. When farm animals are decapitated, it may be wise to perform the procedure in or very close to the burial hole to minimize surface soil contamination with saliva and CSF fluid. Have a sturdy waterproof container ready to package the head.

### **Suggested procedure**

Place the animal in dorsal recumbency and extend the head by pushing the mandible downward. Make a skin incision immediately caudal to the larynx, then section the trachea and other soft tissues down to the dura. Identify the atlanto-occipital joint by flexing the head, and incise the ligaments to open the joint.

Alternatively, forcefully extending the head backwards over a solid object will tear the ligaments, producing an audible and palpable snap. Sever the remaining muscle and skin to completely amputate the head from the body.

If cutting through the vertebra is preferred to arthrotomy, shears or a hacksaw can be used to bisect the atlas. DO NOT use an axe, hatchet, or power saw due to the danger created by flying bone and tissue, and the possibility of aerosolizing virus-contaminated fluids.

If decapitation of a large animal was performed outdoors, any soil or vegetation contaminated with body fluids should be buried with the animal.

### **Carcass disposal**

Because the rabies virus is primarily concentrated in the brain and salivary glands, only the head submitted for testing is considered medical waste. The remaining carcass can be disposed of in the usual manner:

1. incineration (preferred);
2. interment in a pet cemetery; or
3. Bury in accordance with Department of Agriculture Carcass Disposal Rules. See “Recommended Handling Procedures for Animal Carcasses Which Are Potentially Rabid” in Appendix F.

### **NOTES:**

- The movement of large animal carcasses should be done with a minimum of human contact.
- Protective clothing is recommended.
- Rendering of rabid or suspect rabid livestock is prohibited.
- If carcasses must be stored prior to disposal, common sense would dictate that they be sealed in waterproof body bags.

## Appendix A

### RABIES SUBMISSION FORM

**Health and Environmental Testing Lab**

221 State Street, Station 12

Augusta, Maine 04333

Tele: 207-287-2727 Fax: 207-287-6832

After hours: 1-800-821-5821

**LAB #:** \_\_\_\_\_**DATE:** \_\_\_\_\_**Time rec'd:** \_\_\_\_\_**Entered by:** \_\_\_\_\_**Send Report to:** \_\_\_\_\_ **Home Tele:** \_\_\_\_\_**Mailing address:** \_\_\_\_\_ **Work Tele:** \_\_\_\_\_**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_**ANIMAL TESTED (species):** \_\_\_\_\_ **Date of Contact:** \_\_\_\_\_Animal was from **TOWN:** \_\_\_\_\_ **County:** \_\_\_\_\_**DOMESTIC ANIMAL EXPOSURE:**Animal or pet exposed: \_\_\_\_\_ **Vaccination status:** \_\_\_\_\_**Owner's Name:** \_\_\_\_\_ **Home Tele:** \_\_\_\_\_**Mailing address:** \_\_\_\_\_ **Work Tele:** \_\_\_\_\_**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_

Was the animal BITTEN yes [ ] no [ ] describe the exposure and the circumstance of exposure:

\_\_\_\_\_  
\_\_\_\_\_**HUMAN EXPOSURE:****Name:** \_\_\_\_\_ **Home Tele:** \_\_\_\_\_**Mailing address:** \_\_\_\_\_ **Work Tele:** \_\_\_\_\_**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_

Was this person BITTEN yes [ ] no [ ] describe the exposure and the circumstance of exposure:

\_\_\_\_\_  
\_\_\_\_\_**FOR HETL USE ONLY:****RESULT:** FA \_\_\_\_\_ **REPORTED BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_**RESULTS CALLED TO:** \_\_\_\_\_ **DATE:** \_\_\_\_\_ **TIME:** \_\_\_\_\_ **TECH:** \_\_\_\_\_

S/HETL/FORMS/RABIESFORM.DOC

## Appendix B

### HOME QUARANTINE NOTICE

You are hereby required to confine your animal for [10 days] [45 days] [6 months] from the date of this notice in compliance with State rules governing rabies management. Pending the animal control officer's or person acting in that capacity's investigation, this quarantine period could be increased upon further findings. The animal must be kept separate from humans and other animals to observe for signs of rabies and to prevent humans or animals from being exposed.

You must report to the animal control officer (ACO) immediately in case the animal shows signs of illness or behavior changes during the quarantine period. The animal may not run at large nor be left outside unsupervised. The animal shall not be taken from the quarantine area except to be transported to a veterinarian for examination or euthanasia and must be under the direct supervision of a responsible adult, on a leash or tether, no longer than six feet. You may not sell, give away, euthanize or otherwise dispose of the animal during the quarantine period. Escaping from quarantine is regarded as a violation of this order, and must be reported to the ACO immediately. If the animal dies during the quarantine period, the ACO must be notified immediately and the animal tested for rabies.

The ACO must be permitted to make periodic observation or examination of the animal at the place of quarantine during the quarantine period. The animal must be examined by a veterinarian at the end of the quarantine period. Failure to heed this notice and abide by the restrictions herein given will subject the animal to seizure by the ACO for quarantine at owner's expense at a state licensed boarding kennel or veterinary hospital and will subject the owner to any penalties prescribed by State Law.

#### **Owner Identification or Animal Shelter Identification (if stray)**

Name: \_\_\_\_\_

Address: \_\_\_\_\_ Telephone: (H): \_\_\_\_\_

(W): \_\_\_\_\_

Animal Quarantined At: \_\_\_\_\_

I have received the quarantine notice and will comply with quarantine.

Date: \_\_\_\_\_ Owner/Keeper's signature: \_\_\_\_\_

#### **Animal Identification**

Type of Animal: \_\_\_\_\_ M/F: \_\_\_\_\_ Breed: \_\_\_\_\_

Description: \_\_\_\_\_

Date of current rabies vaccination: \_\_\_\_\_ Veterinarian: \_\_\_\_\_

#### **Animal Control Officer**

Animal Observe Dates: \_\_\_\_\_

Signature: \_\_\_\_\_

## Appendix C

### ANIMAL BITE REPORT (page 1 of 2)

(to be filed with municipality records)

Date: \_\_\_\_\_

Case #: \_\_\_\_\_

#### VICTIM IDENTIFICATION (if human contact)

Name: \_\_\_\_\_ DOB: \_\_\_\_\_ M ☐ F ☐

Address: \_\_\_\_\_ Telephone (H) \_\_\_\_\_ (W) \_\_\_\_\_

If minor,

parent/guardian: \_\_\_\_\_ Relationship: \_\_\_\_\_

Address, if different: \_\_\_\_\_ Telephone (H) \_\_\_\_\_ (W) \_\_\_\_\_

Did victim have rabies prevention immunizations prior to this incident? Yes ☐ No ☐ Unknown ☐

#### DOMESTIC ANIMAL IDENTIFICATION (IF ANIMAL CONTACT)

Type of Animal: \_\_\_\_\_ Owned ☐ Stray ☐ Wild ☐

Description: \_\_\_\_\_ M ☐ F ☐ Age: \_\_\_\_\_

If owned – owner/keeper: \_\_\_\_\_ Telephone (H) \_\_\_\_\_ (W) \_\_\_\_\_

Address: \_\_\_\_\_

Date of current rabies vaccination: \_\_\_\_\_ Veterinarian: \_\_\_\_\_ Telephone \_\_\_\_\_

License #: \_\_\_\_\_ State: \_\_\_\_\_ Clinic: \_\_\_\_\_ Tag #: \_\_\_\_\_ Expiration date: \_\_\_\_\_

#### SUSPECT ANIMAL

Type of Animal \_\_\_\_\_ Owned (If Applicable) ( ) STRAY ( ) WILD ( )

DESCRIPTION \_\_\_\_\_ M ( ) F ( ) AGE (IF KNOWN) \_\_\_\_\_

If owned – owner/keeper \_\_\_\_\_ Telephone: \_\_\_\_\_

Address \_\_\_\_\_

Date of current rabies vaccination \_\_\_\_\_ Veterinarian \_\_\_\_\_ Tel. \_\_\_\_\_

License # \_\_\_\_\_ State \_\_\_\_\_ Clinic \_\_\_\_\_ TAG # \_\_\_\_\_ EXP. \_\_\_\_\_  
(RABIES) (DATE)

#### DESCRIPTION OF INCIDENT

Date reported: \_\_\_\_\_ Reported by: \_\_\_\_\_

Date of Bite: \_\_\_\_\_ Type of contact: Bite ☐ Scratch ☐ Other (specify): \_\_\_\_\_

Body part(s) bitten/scratched: \_\_\_\_\_ Medical care required? Yes ☐ No ☐

## Appendix C

### ANIMAL BITE REPORT (page 2 of 2)

Hospital: \_\_\_\_\_ Doctor: \_\_\_\_\_

Was rabies exposure prophylaxis given to victim? Yes ☐ No ☐ Unknown ☐

Date of first prophylaxis immunization: \_\_\_\_\_ second immunization: \_\_\_\_\_

Where did incident take place? \_\_\_\_\_ Provoked? Yes ☐ No ☐

Description of incident: \_\_\_\_\_

### DISPOSITION OF VICTIM ANIMAL

In owner's possession: ☐ Euthanized and sent to HETL for testing: ☐ Unknown (not captured) ☐

Veterinary Hospital: ☐ Animal Shelter: ☐ Boarding Kennel: ☐ Other (specify): \_\_\_\_\_

Name of facility & location: \_\_\_\_\_

\_\_\_\_\_ Telephone: \_\_\_\_\_

Date of quarantine: \_\_\_\_\_ Date of release: \_\_\_\_\_ Veterinary exam? Yes ☐ No ☐

### DISPOSITION OF SUSPECT ANIMAL

In owners possession: ( ) Euthanized and sent to HETL for testing: ( ) Unknown : ( ) Not captured: ( )

Veterinary hospital: ( ) Animal shelter: ( ) Boarding kennel: ( )

Other (specify): \_\_\_\_\_

Name of facility & location: \_\_\_\_\_

Date of quarantine: \_\_\_\_\_ Date of release: \_\_\_\_\_ Veterinary exam? Yes ( ) No ( )

### INVESTIGATING OFFICER

Name  
(print): \_\_\_\_\_ Signature: \_\_\_\_\_

Title: \_\_\_\_\_ Employer: \_\_\_\_\_

Address: \_\_\_\_\_

Enforcement: Rabies Advisory Notice ☐ Quarantine Notice ☐ Civil/Criminal Summons ☐

Other: \_\_\_\_\_

Has animal been ill, acted strangely, or bitten anyone recently? Yes ☐ No ☐ If yes,

explain: \_\_\_\_\_

**Animal Shelter Adoption Disclaimer:**  
**YOUR NEW PET AND RABIES**

A dog, cat or other animal which has been bitten by or exposed to a rabid animal may not develop symptoms of rabies for up to six months. During this time (the incubation period), the exposed animal may appear to be totally healthy. Since the vaccination history of stray and abandoned animals is usually unknown, many of these animals have not had prior protection for rabies. Although all dogs and cats have been carefully screened for signs of exposure to rabid animals prior to adoption, the possibility still exists that your adopted pet could develop rabies. Therefore, it is very important for you to know that these symptoms in your pet could be rabies: change in behavior, vicious or nervous activity, difficulty swallowing, excessive drooling, difficulty walking or paralysis. If your adopted pet develops any of these symptoms, immediately separate it from humans and other animals and have it examined by a veterinarian.

Newly adopted pets should be examined by a veterinarian and vaccinated if they have not been. However, a rabies vaccination will not protect the animal from previous bites or other prior exposures to rabies.

\*\*\*\*\*

I have read this statement and will not hold the \_\_\_\_\_  
\_\_\_\_\_ Shelter responsible should my adopted  
pet develop rabies.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

# **ATTENTION WOLF HYBRID OWNERS**

**If your wolf hybrid (“wolf-mix breed”) bites a person or domesticated animal, it will be euthanized at your expense and tested at the Health and Environmental Testing Laboratories for rabies as soon as possible.**

**There is no rabies vaccine approved for use in a wolf hybrid dog. Although your veterinarian may vaccinate your hybrid, it is unknown whether or not the vaccine provides any protection. Unlike with dogs, cats and ferrets, there is no known quarantine period for a wolf hybrid for purposes of observation of the animal for signs of rabies infection.**

**Examination of brain tissue is the only acceptable means of testing for the presence of rabies virus in a wolf-dog hybrid.**

**Maine Department of Human Services**





### **RECOMMENDED HANDLING PROCEDURES FOR POTENTIALLY RABID ANIMAL CARCASSES**

Since it is possible for rabies to be transmitted from infected animal carcasses, the following steps are recommended when handling the carcass of any animal that has the potential to be rabid.

1. Whenever possible, use a shovel to pick up the carcass. If you must use your hands, use barrier protection such as heavy-duty rubber gloves. If at all possible, avoid touching any wet area on the carcass. However, if the gloves or shovel become wet with bodily fluids, allow them to dry before touching with bare hands. If there is any rabies virus still alive in the animal carcass, the virus will die when it dries.
2. If the gloves or shovel need to be disinfected immediately, use a bleach or bleach and water solution. Remember however, that once bleach is mixed with water, it begins to disintegrate and after 24 hours is no longer considered to be a proper disinfectant.

### **DISPOSAL OF ANIMAL CARCASSES**

Animal carcasses that pose a physical, health or safety hazard should be removed and disposed in an appropriate manner. Carcasses which may be associated with rabies, distemper, or other potentially contagious diseases should receive special consideration to avoid unreasonable contamination or exposure to humans or pets. Animal carcasses should never be disposed of in trash cans or dumpsters. Incineration, burial or appropriate surface disposal may be employed as outlined below.

#### **SINGLE ANIMAL BURIAL:**

Disposal of single, small animal carcasses should be based upon location of the carcass.

1. In areas where the carcass is likely to be encountered by humans or their pets, it should be disposed of by incineration or burial. There are no setback or soil condition requirements for small, single animal burials, but you should avoid wet areas, shallow to bedrock areas or areas very close to water bodies for the burial site. Carcasses should be placed in an excavation, no more than two feet deep, and covered by at least 18 inches of soil to prevent the carcasses from being dug up by another animal.
2. For remote areas, where human or pet contact is unlikely and the rabies threat is minimal, placing the carcass in the woods is an acceptable option. Caution and professional judgement should be exercised when determining whether or not placement is an acceptable disposal method.
3. To transport a potentially rabid animal carcass, use a heavy duty plastic bag such as a bio-hazard bag. If disposal is to be by burial, do not bury the bag along with the carcass. It will not decompose or allow the carcass to decompose. After the carcass has been properly disposed of, carefully place the contaminated bag inside another, clean, plastic bag. Tie the outside bag tightly and then dispose of it in a proper manner (dumpster, trash can etc.). Be careful not to dispose of the bags in a place likely to be searched by persons for returnable bottles or where children frequently play.

## Appendix F

MAINE DEPARTMENT OF AGRICULTURE, FOOD AND RURAL RESOURCES  
STATE HOUSE STATION #28  
AUGUSTA, MAINE 04333

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**PROCEDURE FOR BURIAL OF UP TO 500 LBS. PER YEAR OF CARCASSES IN ACCORDANCE WITH MDAFRR RULES AND POLICY; EFFECTIVE DATE: SEPTEMBER 16, 1996**

1. Select a site which is in an upland position, without a large watershed and which typically does not have a high seasonal water table.
2. Excavate a trench which is three feet or less wide and 18 inches deep. The bottom of the trench must be at least 24 inches above bedrock. Trenches must follow the contour so that the bottom of the trench is level.
3. Carcasses must be placed in the trench to a thickness of no more than 12 inches, limed, and covered with a minimum of 18 inches of fill. The fill surface should be loamed and seeded.
4. Additional trenches may be used if separated by a minimum of three feet, edge of trench to edge of trench.
5. Burial sites must meet the following minimum setback distances, unless a variance is granted by the department:

<u>FEATURE</u>	<u>SETBACK DISTANCE</u>
Perennial (year round) Waterbodies	150'
Intermittent (seasonal) Waterbodies	75'
Public Water System	300'
Private Wells (not owners)	300'
Private Wells (owners)	100'
Roads	50'
Buildings (not owners)	
*Residences	100'
*Non Residences	50'
Buildings (owner)	20'
Property Lines	50'
Significant Sand and Gravel Aquifers	Not Within
10 Year Flood Plain	Not Within
Slopes	15% or less

If you should have any questions, please contact the Maine Department of Agriculture, Food and Rural Resources, Office of Agricultural, Natural and Rural Resources, State House Station #28, Augusta, Maine 04333. Phone: (207) 287-1132.

LARGE VOLUME BURIAL SITES:

Large numbers of carcasses (more than 500 lbs. per year) should be disposed of in accordance with Chapter 211 – Rules for the Disposal of Animal Carcasses, administered by the Maine Department of Agriculture, Food and Rural Resources, when a single burial site is to be used. These Rules also outline appropriate incineration procedures and other disposal methods.

## MAINE STATUTES AND RULES RELATING TO RABIES CONTROL

10: Department of Human Services

144A: Bureau of Health, Division of Disease Control

Chapter 251: Rules Governing Rabies Management

### 1. Authorization.

The Statutory Authority for Rules Governing Rabies Management is 22 MRSA Section 1313 and 22 MRSA Section 1313-A, 1313-B

### 2. Definitions.

**A. Animal Control:** Control of dogs, cats, and domesticated or undomesticated animals in accordance with 7 MRSA Section 3948.

**B. Animal Control Officer (ACO):** An Animal Control Officer or person acting in that capacity that is appointed periodically by municipal officers pursuant to 7 MRSA Chapter 725.

**C. Animal Damage Control Cooperator (ADC):** Also referred to as an ADC agent, a cooperating trapper or hunter certified by the Department of Inland Fisheries & Wildlife and operating as an agent of the Department for purposes of animal damage control.

**D. Confirmed Rabid Animal:** An animal that has been confirmed rabid by the Health & Environmental Testing Laboratory using the direct fluorescent antibody (DFA) test of nervous tissue.

**E. Control:** To limit by reasonable means all unnecessary exposure of the suspected rabid animal to humans or to other animals.

**F. Currently Vaccinated:** Domesticated animals are considered currently vaccinated for rabies if at least 30 days has elapsed since the initial vaccination and the duration of vaccination has not exceeded the time period recommended for that species based upon the type of vaccine used. A Maine “Certificate of Rabies Vaccination” or a form approved by the Commissioner of the Department of Agriculture, Animal Health and Industry is proof of immunization.

**G. Decapitate:** To remove the head using methods recommended by the Department of Human Services. In the context of rabies control, decapitation is to be performed by a veterinarian or, in the case of an undomesticated animal, a veterinarian, game warden, animal damage control agent (ADC), or other trained person as per Inland Fisheries & Wildlife internal memorandum.

**H. Domesticated Animal:** domesticated animals would include but are not limited to: dogs, cats, ferrets, wildlife hybrids, or livestock.

**I. Domesticated Ferret:** *Mustela putorius Furo*, member of the weasel family. Bred by private and commercial breeders and has been domesticated since 600 AD. Domesticated ferret does not include the blackfooted ferret.

**J. Enzootic:** A low but consistent appearance of rabies in a defined area.

**K. Epizootic:** The occurrence of rabies in animals clearly in excess of expected or enzootic levels.

**L. Exposure:** Rabies can only be transmitted when the saliva or neural tissue of an infected animal is introduced into open cuts or wounds in person's or animal's skin or contacts the mucous membranes (e.g. mouth, nose, eyes). The two categories of exposure are:

- (1) **Bite:** Any penetration of the skin by an animal's teeth. Bites, in general, are high risk exposures. Bites to the face and hands carry the highest risk.
- (2) **Nonbite exposure:** Scratches, abrasions, open wounds or mucous membranes contaminated with saliva or neural tissue from a rabid animal constitute nonbite exposures. If the material containing the virus is dry, the virus can be considered noninfectious.

**M. Quarantine Facility:** An area where a domesticated animal is placed so as to have no other animal contact and preferably no direct human contact or very limited human contact.

**N. Livestock:** Horses, cows, sheep, goats, swine, domesticated deer or any other agricultural mammal.

**O. Non-exposure:** Other contact by itself, such as being in the vicinity of petting or handling an animal, or coming into contact with the blood, urine, or feces of an animal, does not constitute exposure, and therefore does not require post-exposure vaccination.

**P. Observation:** Term used to describe the period of time (45 days) that a vaccinated, domesticated animal is to be observed for signs of rabies after having been exposed to a rabid or suspect rabid animal.

**Q. Owned Animal:** Domesticated animals, as well as animals in petting zoos and circuses that have a known owner.

**R. Quarantine:** Term used to describe the period of time that a domesticated animal is to remain separate and apart from other animals and humans after having bitten or otherwise exposed another domesticated animal, human, or has itself been exposed to a known or suspected rabid animal.

**S. Rabies Management Manual:** A manual written by Maine's Rabies Work Group to provide information on rabies as a disease, outline prevention, and treatment of rabies exposure in humans, domesticated animals, and wildlife and to help municipalities and animal care facilities develop their own rabies response plans.

**T. Stray Animal:** Domesticated animals that have no known owner.

**U. Suspected Rabid Animal:**

- (1) Any mammal, undomesticated or domesticated, showing signs of rabies.
- (2) Any undomesticated mammal which has potentially exposed, through bite or non-bite exposure, a human or domesticated animal to rabies.
- (3) Any domesticated mammal which has bitten a human or domesticated animal.

**V. Undomesticated Animal:** A mammal considered to be wild by nature by the Department of Inland Fisheries & Wildlife.

**W. Unvaccinated Animal:** An animal with no previous rabies vaccination, an animal whose first vaccination was given within the last 30 days, an animal whose last vaccination has expired (per vaccine manufacturer's recommendations), or an animal for which no approved vaccine exists.

**X. Wolf Hybrid:** "Wolf Hybrid" means a mammal that is the offspring of the reproduction between a species of wild canid or wild canid hybrid and a domestic dog or wild canid hybrid. "Wolf hybrid" includes a mammal that is represented by its owner to be a wolf hybrid, coyote hybrid, coy dog or any other kind of wild canid hybrid.

**3. Responding to suspected rabid animal complaints:**

An ACO must respond to a report of a stray domesticated or undomesticated animal suspected of having rabies. The ACO may respond to a report of an owned domesticated animal suspected of having rabies when the municipality regards the animal as a threat to public health.

**4. Control, capture, and transportation of suspected rabid animals.**

A. Stray domesticated animals:

- (1) Suspected rabid animals that are strays must be controlled or captured by the ACO.
- (2) ACO must coordinate with and transport sick stray animals directly to a veterinarian or, if a veterinarian is unavailable, to an animal shelter where it shall be placed under quarantine until a veterinarian can examine the suspected rabid animal.
- (3) A law enforcement officer or ACO qualified to shoot may shoot or otherwise humanely euthanize a suspected rabid animal if harm to humans or other animals is imminent. The animal must not be shot in the head, nor must the head be destroyed or disposed of, but instead must be submitted for testing if there is any chance that there was contact between the suspect animal and humans or domesticated animals.
- (4) If testing of the suspected rabid animal is necessary, the ACO must arrange for decapitation of stray animals and assure transportation of the suspected rabid animal to the Health & Environmental Testing Laboratory. The carcass must be disposed of properly as per the "Animal Carcass Disposal" recommendations contained in the Appendix.

## Appendix G

### B. Owned domesticated animals:

- (1) Control and capture of owned domesticated animals is the responsibility of the owner or keeper.
- (2) The owner must coordinate with and transport sick animals directly to a veterinarian.
- (3) The municipality must be contacted by the owner.
- (4) The municipality may capture and control owned domesticated animals if the municipality regards the animal as a threat to public health.
- (5) A law enforcement officer or ACO qualified to shoot may shoot or otherwise humanely euthanize a suspect rabid animal if harm to humans or other animals is imminent. The animal must not be shot in the head, nor must the head be destroyed or disposed of but, instead, must be submitted for testing.
- (6) If testing of the suspect rabid animal is necessary, the owner or keeper must arrange for decapitation of animals and assure transportation of the suspected rabid animal to the Health & Environmental Testing Laboratory. The carcass must be disposed of properly as per the Rabies Management Manual, Rabies Testing -Specimen Preparation Section. An ACO may assist in coordination if the municipality regards the animal as a threat to public health.

### C. Undomesticated animals:

- (1) Suspected rabid animals must be controlled or captured by the ACO or ADC agent. The game warden should be contacted prior to responding.
- (2) If human or domesticated animal exposure has occurred, the undomesticated animal should be shot or otherwise humanely euthanized by a law enforcement officer, game warden, ADC agent or qualified ACO. The animal must not be shot in the head, nor must the head be destroyed or disposed of but, instead, must be submitted for testing.
- (3) A game warden may arrange for decapitation and assure transportation of the suspected rabid animal. The carcass must be disposed of properly as per the “Animal Carcass Disposal” recommendations in the Appendix.

## **5. Domesticated animals that bite humans or other domesticated animals.**

- A. Unhealthy domesticated animals: Any domesticated animal showing unusual behavior or signs of illness must be examined by a veterinarian to determine if testing is necessary.
- B. Owned dogs, cats and ferrets must be quarantined, as per Section 8, for ten (10) days and observed for signs of rabies.

## Appendix G

### C. Livestock:

- (1) Livestock with proof of current rabies vaccination and who are not in an area currently epizootic for rabies must be observed for ten (10) days.
- (2) Livestock without proof of current rabies vaccination and who are not in an area currently epizootic for rabies must be separated from other animals, have limited contact with people and observed for ten (10) days.
- (3) Livestock in an area epizootic for rabies, which are or are not currently vaccinated for rabies must be observed for thirty (30) days and must have no contact with other animals and limited contact with humans. The municipality must be notified and may take action if the animal is perceived to be a public health threat.

D. Wolf hybrids: If a wolf hybrid suspected of having rabies bites or otherwise exposes to rabies a person or a domestic animal, an ACO, a local health officer or a game warden must immediately remove the wolf hybrid or cause the wolf hybrid to be removed and euthanized for testing. When in the judgement of the animal control officer, local health officer, game warden or law enforcement officer, the animal poses an immediate threat to a person or domestic animal, the animal control officer, local health officer, game warden or law enforcement officer may immediately kill or order killed that animal without destroying the head. The ACO shall make the arrangements for transportation of the head to the State Health and Environmental Testing Laboratories.

E. Stray dogs: Must be quarantined for ten (10) days in a state licensed animal shelter or euthanized and tested after eight days.

F. Stray cats: May be immediately euthanized and tested with concurrence from the municipality and the Department of Human Services, or be quarantined at a state licensed animal shelter for ten (10) days.

### **6. Undomesticated animals that bite or otherwise expose humans or domesticated animals.**

- A. The undomesticated animal should be captured and humanely euthanized. The head must be submitted for rabies testing.
- B. If capture is not possible, or if imminent danger exists, the undomesticated animal may be shot by a law enforcement officer, game warden, or qualified ACO. The animal should not be shot in the head.

### **7. Domesticated animals exposed to rabid or potentially rabid animals.**

A. Owned dogs, cats and ferrets with current proof of rabies vaccination.

- (1) Dogs, cats and ferrets exposed to a confirmed or suspected rabid animal must be immediately boosted with rabies vaccine and confined for forty - five (45) days in

## Appendix G

either a state licensed boarding kennel, veterinary hospital, or home in an escape proof building as per conditions in Section 8.

(2) Dogs, cats and ferrets inflicted with wounds of unknown origin must be immediately boosted with rabies vaccine and the owner or keeper must observe the animal for signs of rabies for forty - five (45) days.

B. Owned dogs, cats, and ferrets without proof of current rabies vaccination.

(1) Dogs, cats and ferrets exposed to a confirmed or suspect rabid animal, and dogs, cats and ferrets inflicted with wounds of unknown origin, should be euthanized or must be kept in quarantine in a state licensed boarding kennel, veterinary hospital, or at home under the direct supervision of the animal control officer, for six months as per conditions outlined in Section 8. The animal must be vaccinated one month before release.

C. Stray dogs: Must be quarantined eight (8) days in a state licensed animal shelter (7 MRSA Section 3913, 4B) and then euthanized. A veterinarian can authorize euthanasia prior to the eight (8) day quarantine period (7 MRSA Section 3913, 5).

D. Stray cats and ferrets without proof of current rabies vaccination must be euthanized immediately.

E. Stray or owned wildlife hybrids must be euthanized regardless of vaccination status.

F. Livestock:

(1) All cases of confirmed exposure must be reported to the Department of Agriculture, Animal Health and Industry.

(2) Vaccinated livestock will be immediately revaccinated and quarantined for forty-five (45) days with limited human contact and have no animal contact.

(3) Animals that are not currently vaccinated for rabies must be euthanized or, in lieu of euthanasia, quarantined from other animals and have limited human contact for a period of six months starting the day of the exposure.

(4) The use of the animal or the animal's by-products for human consumption is subject to the policies of the Maine Department of Agriculture and the U.S. Department of Agriculture.

### **8. Conditions of quarantine periods for domesticated animals.**

A. The quarantine period and the conditions of the quarantine, as stated on the state approved quarantine notice (see page 48), start the day of exposure.



## **Appendix G**

- B. The ACO must have access to the quarantine area in the event the municipality wishes to periodically check the quarantined animal.
- C. The owner or keeper is responsible for separation and observation. If separation and observation is not possible on an owner's or keeper's property, the owner or keeper must make arrangements for that animal at a licensed boarding kennel or veterinary clinic. The owner or keeper assumes all responsibility and risk for ensuring proper quarantine of a domestic animal. If the municipality determines that a domestic animal is a public health risk, the municipality may assume control of the quarantine of the animal.
- D. The owner or keeper of that animal will be financially responsible for all expenses incurred for a domesticated animal.
- E. If the animal shows any changes in health or behavior, the animal must be examined by a veterinarian, who will determine if rabies testing is indicated. The veterinarian shall be informed by the owner/keeper that the animal is under rabies quarantine.
- F. If the animal escapes, the owner or keeper must immediately notify the ACO, however, the owner or keeper is responsible and assumes all risk resulting from an escaped animal.
- G. The owner or keeper may not sell, give away, euthanize or otherwise dispose of the animal during the quarantine period.
- H. All animals must be examined by a veterinarian at the end of the quarantine period unless otherwise noted.
- I. The determination for euthanasia of all domesticated animals must be made by a veterinarian in consultation with the Department of Human Services.
- J. The animal may not run at large nor be left outside unsupervised. The animal must not be taken from the quarantined area except to be transported to a veterinarian for examination or euthanasia. During transport to and from the quarantine facility, the animal must be under the direct supervision of a responsible adult, on a leash or tether no longer than 6 feet.

### **9. Notification and reporting.**

Any persons bitten by any animal reasonably suspected of having rabies must immediately notify the municipality in which the bite occurred. The owner, keeper or person having possession and knowledge of any animal which has bitten any person or animal or of any animal which exhibits any sign of rabies must notify the municipality in which the bite occurred.

### **10. Decapitation and preparation of suspected rabid animals.**

- A. When decapitation and testing is recommended by the Health Environmental Testing Laboratory:

## Appendix G

- (1) Domesticated Animals: A veterinarian must decapitate and prepare domesticated animals that are to be tested for rabies.
  - (2) Undomesticated Animal: A veterinarian, game warden or trained personnel as per the Department of Inland Fisheries & Wildlife internal memorandum must decapitate and prepare undomesticated animals that are to be tested for rabies.
- B. Decapitation and preparation of suspected rabid animal for transporting is subject to procedures written in the Rabies Management Manual, Rabies Testing section.
- C. Professionals that may assist in the coordination of transportation, include but are not limited to, ACO's, veterinarians, game wardens, law enforcement officers. Department of Human Services must have prior notification of transporting an animal to the Health and Environmental Laboratory for the purposes of rabies testing.

**Human Services Laws Governing Rabies**  
**22 MRSA**

**22 MRSA §1313. Procedures for the transportation, quarantine, euthanasia and testing of animals suspected of having rabies.**

**1. Establishment of procedures.** The commissioner, in consultation with the Commissioner of Agriculture, and the Commissioner of Inland Fisheries and Wildlife shall adopt rules, in accordance with the Maine Administrative Procedure Act, establishing procedures for responding to a report of an animal suspected of having rabies. The procedures must include provisions for the transportation, quarantine, euthanasia and testing of an animal suspected of having rabies. The procedures may differ based on the perceived public health threat determined in part by consideration of the following factors:

- A. Whether the animal is a domesticated animal for which a known effective vaccine exists and, if so, can the animal's vaccination status be verified; and
- B. Whether the animal has bitten a person or exhibited other aggressive behavior.

**2. Role of animal control officer; game warden.** An animal control officer appointed in accordance with Title 7, section 3947, receiving a report of an animal suspected of having rabies shall ensure that the procedures established pursuant to this section and section 1313-A are carried out. If the animal is an undomesticated animal, a game warden shall assist the animal control officer.

**3. Costs associated with transportation, quarantine, testing and euthanasia.** The Department of Inland Fisheries and Wildlife shall pay all costs for transportation, quarantine, euthanasia, and testing of an undomesticated animal suspected of having rabies. The owner of a domesticated animal suspected of having rabies shall pay all costs for transportation, quarantine, euthanasia and testing of the animal. If a domesticated animal is a stray or the owner is unknown, the municipality in which the animal was apprehended is responsible for transportation, quarantine, euthanasia and testing costs.

**22 MRSA §1313A. Provisions for immediate destruction of certain animals.**

If an undomesticated animal or a wolf hybrid suspected of having rabies bites or otherwise exposes to rabies a person or a domestic animal, an animal control officer, a local health officer or a game warden must immediately remove the undomesticated animal or wolf hybrid or cause the undomesticated animal or wolf hybrid to be removed and euthanized for testing. When in the judgement of the animal control officer, local health officer, game warden, or law enforcement officer the animal poses an immediate threat to a person or domestic animal, the animal control officer, local health officer, game warden, or law enforcement officer may immediately kill or order killed that animal without destroying the head. The Department of Inland Fisheries and Wildlife shall arrange for the transportation of the head to the State Health and Environmental Testing Laboratory; except that the animal control officer shall make the arrangements if the animal is a wolf hybrid.

The Department of Inland Fisheries and Wildlife shall pay transportation and testing costs for undomesticated animals. The owner of a wolf hybrid shall pay transportation and testing costs for that animal.

**22 MRSA §1313-B Civil violation, court authorization for removal and other remedies.**

1. **Violation.** A person who violates a rule established under this chapter commits a civil violation for which a forfeiture of not less than \$100. Nor more than \$500 may be adjudged for each offense. In addition, the court may include an order of restitution as part of the sentencing for costs including removing, controlling and confining the animal.
2. **Court authorization for removal.** When home quarantine procedures, as described on the official notice of quarantine, have been violated, or in the case of a wolf hybrid, when the owner fails to bring the animal to a veterinarian for euthanasia and testing or to turn the animal over to authorities as required by rules established pursuant to this chapter, an animal control officer, person acting in that capacity or law enforcement officer may apply to the District Court or Superior Court for authorization to take possession of the animal for placement, at the owner's expense, in a veterinary hospital, boarding kennel, or other suitable location for the remainder of the quarantine period or, in the case of a wolf hybrid, removal for euthanasia. At the end of the quarantine period for domestic animals, or if the animal shows signs of rabies, the person in possession of the animal must report to the court, and the court shall either dissolve the possession order or order the animal euthanized and tested for rabies.
3. **Other remedies.** In addition to filing a civil action to enforce this section:
  - A. The municipality may record a lien against the property of the owner or keeper of an animal if the person fails or refuses to comply with an order to confine or quarantine the animal;
  - B. The municipal officers or their designated agent, such as the animal control officer, shall serve written notice on the owner or keeper of the animal that specifies the action necessary to comply with the order and the time limit for compliance;
  - C. If the owner or keeper of the animal fails to comply within the time stated, the animal control officer must apply to District Court or Superior Court for an order to seize the animal and make arrangements for quarantine or euthanasia at the owner's or keeper's expense; and
  - D. If the owner or keeper of the animal fails to pay the costs of quarantine within 30 days after written demand from the municipal officers, the municipal assessors may file a record of lien against the property of the owner or keeper of the animal.

**REGULATIONS REGARDING RABIES  
IMMUNIZATION REQUIREMENTS FOR DOG LICENSURE**

10-144            DEPARTMENT OF HUMAN SERVICES

BUREAU OF HEALTH

Chapter 260:        REGULATIONS REGARDING RABIES IMMUNIZATION  
                         REQUIREMENTS FOR DOG LICENSURE

**SUMMARY:** These rules state and explain the requirements for rabies vaccination of puppies and dogs, as required for licensure. These rules are consistent with 7 M.R.S.A. Section 3922(3) and with current veterinary practice and vaccine specifications.

1.     No license shall be issued for any dog, including kennel dogs, in the State without the presentation of a valid certificate showing that the animal has been immunized against rabies, or presentation of a valid letter of exemption, as described in paragraph 5. Letters deemed not to meet the requirements of paragraph 5 must be rejected by the licensing agent.
2.     Except as hereinafter provided, the only valid certificate of immunization shall be the certificate of immunization specified by the National Association of State Public Health Veterinarians in effect at the time the dog is subject to licensure or renewal of license, and authenticated by a licensed veterinarian. Certificates generated by computer systems, and containing the same information, in the same locations, shall be considered acceptable alternative certificates. The certificate must be fully completed, and must show the date of vaccine administration, and the date a booster vaccination is due (expiration date), in accordance with the manufacturer's label for the vaccine used. Only vaccines licensed by the US Food and Drug Administration shall be used.
3.     The certificate must show that the immunization is effective at the time of licensure.
4.     For dogs vaccinated in other states, or Canadian Provinces, a certificate of immunization consistent with the requirements of the National Association of State Public Health Veterinarians, and authenticated by a Veterinarian licensed in that state or province, in effect at the time of licensing shall be considered acceptable. If any other certificate is presented, the owner shall be advised by the municipal clerk to present the certificate to a Maine licensed Veterinarian for authentication or for preparation of a National Association of State Public Health Veterinarians certificate.

## Appendix G

5.

- A. A letter of exemption from vaccination may be submitted for licensure, if a medical reason exists that precludes the vaccination of the dog. Qualifying letters must be in the form of a written statement, signed by a licensed veterinarian, that includes a description of the dog, and the medical reason that precludes vaccination. If the medical reason is temporary, the letter shall indicate a time of expiration of the exemption.
- B. A dog exempted under the provisions of paragraph 5 A, above, shall be considered unvaccinated, for the purposes of 10-144 C.M.R. Ch.251, Section 7(B)(1), (Rules Governing Rabies Management) in the case of said dog's exposure to a confirmed or suspect rabid animal.

STATUTORY AUTHORITY: 7 M.R.S.A., Sec. 3922(3)

Effective Date, April 11, 2005

**Animal Welfare Laws Governing Rabies**  
**7 MRSA**

**7 MRSA §Section 3907. Definitions**

- 3. Animal control.** “Animal control” means control of dogs, cats, and domesticated or undomesticated animals in accordance with section 3948.
- 4. Animal control officer.** “Animal control officer means the person appointed periodically by a municipality pursuant to chapter 725.
- 30. Wolf Hybrid.** “Wolf hybrid” means a mammal that is the offspring of the reproduction between a species of wild canid or wild canid hybrid and a domestic dog or wild canid hybrid. “Wolf hybrid” includes a mammal that is represented by its owner to be a wolf hybrid, coyote hybrid, coy dog or any other kind of wild canid hybrid.

**7 MRSA §3916. Rabies vaccinations**

- 1. Required for cats.** Except as provided in subsection 4, an owner or keeper of a cat over 3 months of age must have that cat vaccinated against rabies. Rabies vaccine must be administered by a licensed veterinarian or under the supervision of a licensed veterinarian. Upon receiving an initial vaccination, a cat is considered protected for one year and an owner or keeper of that cat must get a booster vaccination for that cat one year after the initial vaccination and subsequent booster vaccinations at intervals that do not exceed the intervals recommended by a national association of state public health veterinarians for the type of vaccine administered.
- 2. Certificate.** A licensed veterinarian who vaccinates or supervises the vaccination of a cat shall issue to the owner or keeper, a certificate of rabies vaccination approved by the State and shall indicate on the certificate the date by which a booster vaccination is required pursuant to subsection 1.
- 3. Enforcement.** A humane agent, and animal control officer or a law enforcement officer may ask an owner or keeper of a cat to present proof of a certificate of rabies vaccination from the State.
- 4. Exception.** Notwithstanding any provision of this chapter, an animal shelter operated by a nonprofit organization is not required to vaccinate an abandoned or stray cat received by the shelter.

An owner or keeper of a cat is exempt from the requirements of subsection 1 if a medical reason exists that precludes the vaccination of the cat. To qualify for this exemption, the owner or keeper must have a written statement signed by a licensed veterinarian that includes a description of the cat and the medical reason that precludes the vaccination.

## **7 MRSA §3922. Issuance of License**

**3, Proof of immunization.** Except as provided in subsection 3-A, a municipal clerk may not issue a license for a dog until the applicant has filed with the clerk proof that the dog has been immunized against rabies in accordance with rules adopted by the Commissioner of Human Services, except that the requirement of immunization may be waived by the clerk under conditions set forth by the Commissioner of Human Services.

**3-A.Exception to immunization requirement for wolf hybrids.** If a person applying for a license declares that the dog is a wolf hybrid, a municipal clerk may issue a license without proof that the dog has been immunized against rabies. In accordance with subsection 5, the license issued for the dog must state that the dog is a wolf hybrid.

## **7 MRSA §3922, sub-§5, Form of License.**

The license must state the breed, sex, color and markings of the dog, whether the animal is a dog or wolf hybrid and the name and address of the owner or keeper. If the person applying for a license declares that the dog is a wolf hybrid, the license must state that the dog is a wolf hybrid. The license must be issued in triplicate and the original must be given to the applicant and the remaining 2 copies must be retained by the municipal clerk or dog recorder.

## **7 MRSA §3922, sub-§6. Designation of wolf hybrid.**

An owner or keeper of a dog declared as a wolf hybrid may not change the license designation. A dog that has been declared a wolf hybrid must be treated as a wolf hybrid in accordance with Title 22, chapter 251, subchapter V.

## **7 MRSA §3947. Animal control officers.**

Each municipality shall appoint one or more animal control officers whose duties are enforcement of sections 3911, 3912, 3921, 3924, 3943, 3948, 3950, 3950-A and 3966 to 3970 responding to reports of animals suspected of having rabies in accordance with Title 22, sections 1313 and 1313-A and such other duties to control animals as the municipality may require.

A municipality may not appoint a person who has been convicted of a criminal violation under Title 17, chapter 42 or has been adjudicated of a civil violation for cruelty to animals under chapter 739 to the position of animal control officer.

Animal control officers must be certified in accordance with section 3906-B, subsection 4. Upon initial appointment an animal control officer must complete training and be certified by the commissioner within 6 months of appointment.

Upon appointment of an animal control officer, municipal clerks shall notify the commissioner of the name, address, and telephone number of the animal control officer.



**7 MRSA §3948. Animal control**

- 1. Control.** Municipalities shall control dogs and ferrets running at large.
- 2. Medical attention.** Law enforcement officers, humane agents and animal control officers shall take a stray animal to its owner, if known, or, if the owner is unknown, to a shelter and ensure that any injured animal that is at large or in a public way is given proper medical attention.
- 3. Domesticated and undomesticated animals.** A municipality shall control domesticated animals that are a problem in the community. A municipality shall control undomesticated animals in matters on which no other department is charged by law to regulate.

## BAT EXCLUSION

Most bats are healthy and contribute to our environment in many ways, particularly by consuming insect pests. Less than 1/2 % (1 out of 200) of bats randomly sampled are positive for the rabies virus.

One rabid bat in a colony does not mean the entire colony is infected. Testing other members of the colony rarely results in finding another rabid bat.

Bat rabies is generally independent from rabies in terrestrial mammals, but transmission from bats to other wildlife, unvaccinated domestic animals and humans can occur. Bat rabies strains have been found in grey foxes, domestic cats and livestock in areas, which were otherwise free of terrestrial animal rabies. In those cases, the virus detected in the infected animal was the bat rabies virus.

There is no evidence that bats can transmit rabies for an extended period without being ill. Bats, like other mammals, become sick and eventually die from the disease. Bats infected with rabies may have the virus in their saliva and may transmit the disease to humans and other animals. This type of exposure most commonly occurs through a bite.

Rabid bats may show abnormal behavior, such as extended outdoor activity during daylight; rabid bats may be grounded, paralyzed or may bite a person or animal. Not all rabid bats act abnormally, but bats that do are more likely to have rabies.

Rabid bats rarely attack humans. But, because rabies can occur anywhere and because rabies can be fatal, any contact with bats should be strictly avoided. Each contact with a bat should be managed by health authorities.

Unnecessary killing of bats is neither an environmentally sound, humane, nor permanent solution. Using chemicals or pesticides creates a risk of long-term toxic exposure to humans and causes sick or dying bats to be grounded in the community, further increasing the chance of contact with people and pets. No toxicant is legally registered for use against bats.

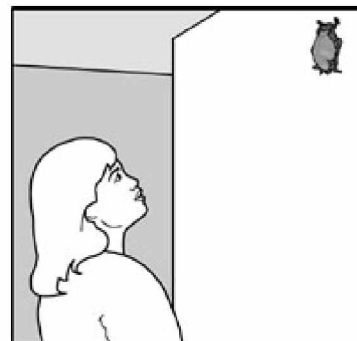
Bats should be kept out of places where there is a high risk of contact with humans or pets (for example, schools, hospitals, prisons, and homes) by closing or covering openings that allow entry to the roost. There are many sources of information, including the Internet, libraries, and professional exterminators/contractors, on “bat proofing” your home.

The following excerpt is from *Bats in Buildings: An Information and Exclusion Guide*, by Barbara French, Laura Finn, and Mark Kiser. It is available from Bat Conservation International, Inc., at [www.batcon.org](http://www.batcon.org).

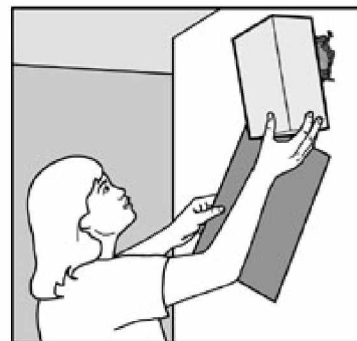
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### Introduction

As primary predators of night-flying insects, bats play a vital role in maintaining the balance of nature. A single little brown bat can catch 1,200 mosquito-sized insects in an hour, and big brown bats are important predators of some of America's most costly crop pests. Cucumber beetles, June beetles, bark beetles, stink bugs, leafhoppers, cutworm moths, corn earworm moths, armyworm moths, termites, assassin bugs, ants, roaches, crickets, and grasshoppers are just some of the many pests known to be consumed by America's bats. Yet, bat populations are in alarming decline due to decades of unwarranted human fear and persecution.



As traditional roosts in trees and caves have been destroyed, many of North America's bats have been forced to seek shelter in man-made structures. An understanding of the habits of these beneficial animals can help solve problems that sometimes develop when bats roost in buildings. The following pages provide details about safe, effective methods for permanently evicting bats from buildings when necessary. These methods help ensure the safety of both humans and bats.



### Accidental Intruders

#### *What if you find a bat in your home?*

On occasion, a solitary bat may accidentally fly into a home, garage or other building through an open door or window. Such incidents often involve lost youngsters whose primary goal is a safe escape. These bats will usually leave on their own if a window or door to the outside is opened while others leading to the rest of the building are closed –**do NOT allow the bat to escape if there was any possibility of contact between the bat and a human or pet (see pages 29-30 of the text).** Bats are rarely aggressive, even if chased, but may bite if handled. As with any wild animal, bats should not be touched with bare hands, and anyone bitten should immediately seek medical consultation.



Only animal control officers, game wardens, or pest management personnel should capture live bats. If a citizen must capture a bat that may need to be tested for rabies, the following technique should be utilized (**damaging the bat's head should be avoided as it may prevent a rabies testing from being performed**): 1) use caution and avoid direct contact with the bat; wear leather gloves if possible, 2) wait until it lands, and then cover it with a small box, coffee can, or other container; 3) slip a piece of cardboard under the container, thus trapping the bat, 4) secure the bat by taping the cardboard tightly to the container, 5) wash your hands with soap and water, and 6) call your local animal control officer, game warden, or pest management personnel to assist in arranging for rabies testing of



the bat at the State's Health and Environmental Testing Laboratories in Augusta. Slip a piece of cardboard between the wall and box, slide the bat into the box, then release the bat outside. You may also catch it by hand, using leather work gloves to avoid being bitten. Keep doors and windows to buildings closed, and window screens in good repair, to prevent bats from reentering.

### ***Where do bats roost?***

Bats may roost in attics, soffits, louvers, chimneys, under siding, eaves, roof tiles or shingles and behind shutters (see diagram). In sports stadiums and parking garages, bats sometimes roost in expansion joints between concrete beams. They can enter through openings as small as one-half inch in diameter (1.3 cm). Common points of entry include open windows or doors, broken or poorly-fitted screens, loose or missing shingles or tiles, places where flashing or boards have come loose and locations where pipes or wiring enter buildings. Openings often occur where walls meet the eaves at the gable ends of an attic, where porches attach to the main part of a house, or where dormers meet the roof. Other points of entry are associated with siding. For example, cracks and crevices are often created where siding forms corners, or at places where it meets windows, doors or chimneys (see diagram). Bats can sometimes be detected by the presence of black or brown stains from body oils or droppings around cracks or crevices formed by ill-fitting building materials. Bat droppings may also appear on walls, under porches or decks, or on floors beneath dilapidated ceilings. Bat droppings are dark and do not contain any white material. Although they may resemble small hard rodent pellets, bat droppings are soft and easily crushed, revealing shiny insect parts.



*Common entry points on homes and buildings include corners, eaves and louvers.*

### Providing a safe exit for bats

There is little reason to evict bats from buildings where they are not causing a nuisance. However, bats should be prevented from entering human living quarters. This can be accomplished by inspecting the inside of a building for small openings through which bats could enter. All openings connecting the attic or other roosting areas to inside living quarters should be sealed, although entry points on the outside of the building should be left open, allowing bats to exit. Draft-guards should be placed beneath doors to attics; electrical and plumbing holes should be filled with steel wool, caulking or weatherstripping. Bats have small teeth for eating insects; they do not gnaw through wood or other building materials like rodents. Caulking, flashing, screening or insulation can be used to seal most openings on the inside. Expanding urethane foam products should not be used to seal cracks where bats are active, because they can become caught in it. Caulk should also be applied early in the day so that it has time to dry before bats emerge in the evening.

In some instances, noise or odors from large colonies of bats can become a nuisance. When bats must be evicted from a building, netting or tubes that function as one-way valves must be placed over the openings bats use to enter and exit. These one-way valves allow bats to leave, but not reenter the building. Valves may be constructed from lightweight plastic netting (1/6 inch-0.4 cm-or smaller mesh), or plastic pipes or tubes. These exclusion devices should be left in place for five to seven days to ensure all bats have exited. It is not appropriate simply to wait for bats to fly out at night and then seal openings. Not all of the bats leave at the same time, and some bats may remain inside all night. Take weather conditions into consideration when deciding how long to leave the netting or tubes in place; there may be evenings (such as during storms), when no bats exit.

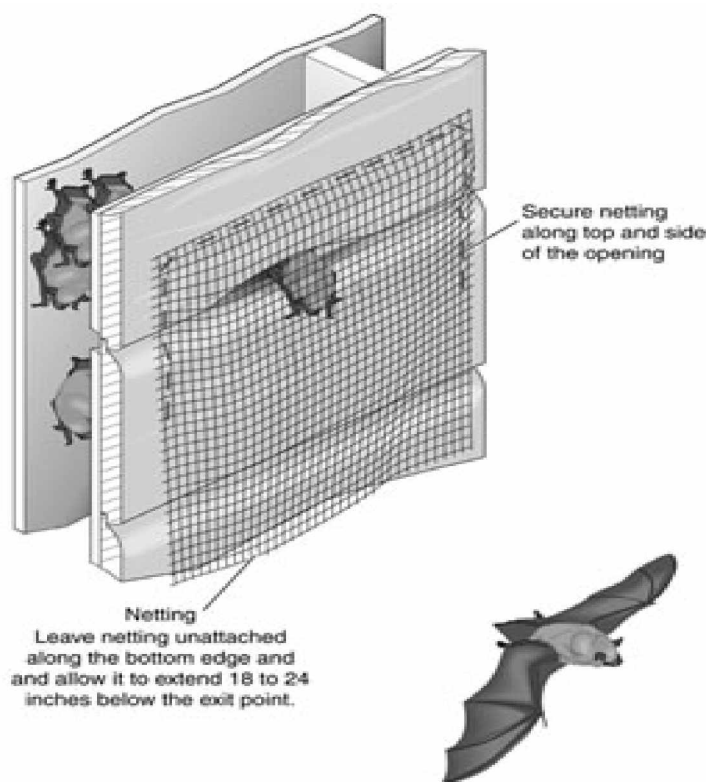
Bats often roost in buildings seasonally, including during maternity periods, and exclusions should not take place until young bats are able to fly. After the young are old enough to fly, all bats can be excluded. The maternity season begins as early as mid-April in the southernmost U.S., mid-June in the northern U.S. and Canada. Young bats are flying and exclusions can resume by late August. In late fall most house-dwellings bats either migrate to warmer climates or enter caves or abandoned mines to hibernate. However, a few species can hibernate in buildings, and in the mildest climates, they may even remain active year-round. If bats are present in cold regions during the winter, exclusions should be postponed until spring when they emerge to feed.

Exclusion is the **ONLY** effective solution for permanently removing bats from buildings. Trapping and relocating is ineffective since bats have excellent homing instincts and simply return, even when released at great distances. The use of pesticides against bats is illegal and counterproductive. Poisoning greatly increases the likelihood of bats coming into contact with people and pets.

Naphthalene, the active ingredient in moth balls, and ultrasonic devices are often promoted as bat repellents. However, ultrasonic devices are ineffective against bats, and to be effective, naphthalene must be used in such large quantities that it poses a significant health hazard to humans.

### Using Netting to Exclude Bats

Bats sometimes enter buildings through openings on smooth surfaces of exterior walls or through louvers. In such cases, plastic or lightweight, flexible netting with 1/6 inch (0.4 cm) mesh or smaller, should be secured to the building along the top and sides of the opening as shown in the diagram. It should extend 18 to 24 inches (46 to 61 cm) below the bottom edge of the opening and should remain in place for a minimum of five to seven days to ensure all bats have exited. Then, openings should be permanently sealed with silicone caulking, caulk backing rod, hardware cloth, or heavy-duty netting. In some cases, sealing may require repair or replacement of old, deteriorated wood. When bats are using multiple openings to exit and enter, exclusion material should be placed on each opening unless it can be determined with certainty that all areas used by the bats are connected. If so, some openings can be sealed as described above, and netting can be placed over the openings used by the most bats. Even when all roosting areas are connected, bats will sometimes refuse to use alternative exits. In this case, exclusion material must be installed over all exits. After this has been done, watch to make sure the bats are able to exit safely. If they do not appear to be exiting, or appear to be having trouble doing so, make adjustments or add new valves as needed.

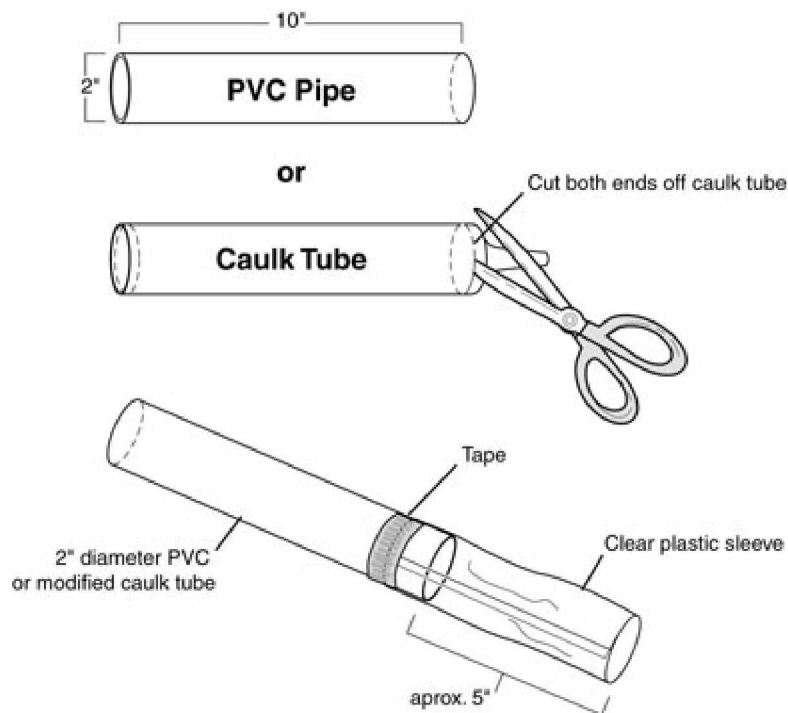


### Using PVC pipe or Empty Caulking Tubes to Exclude Bats

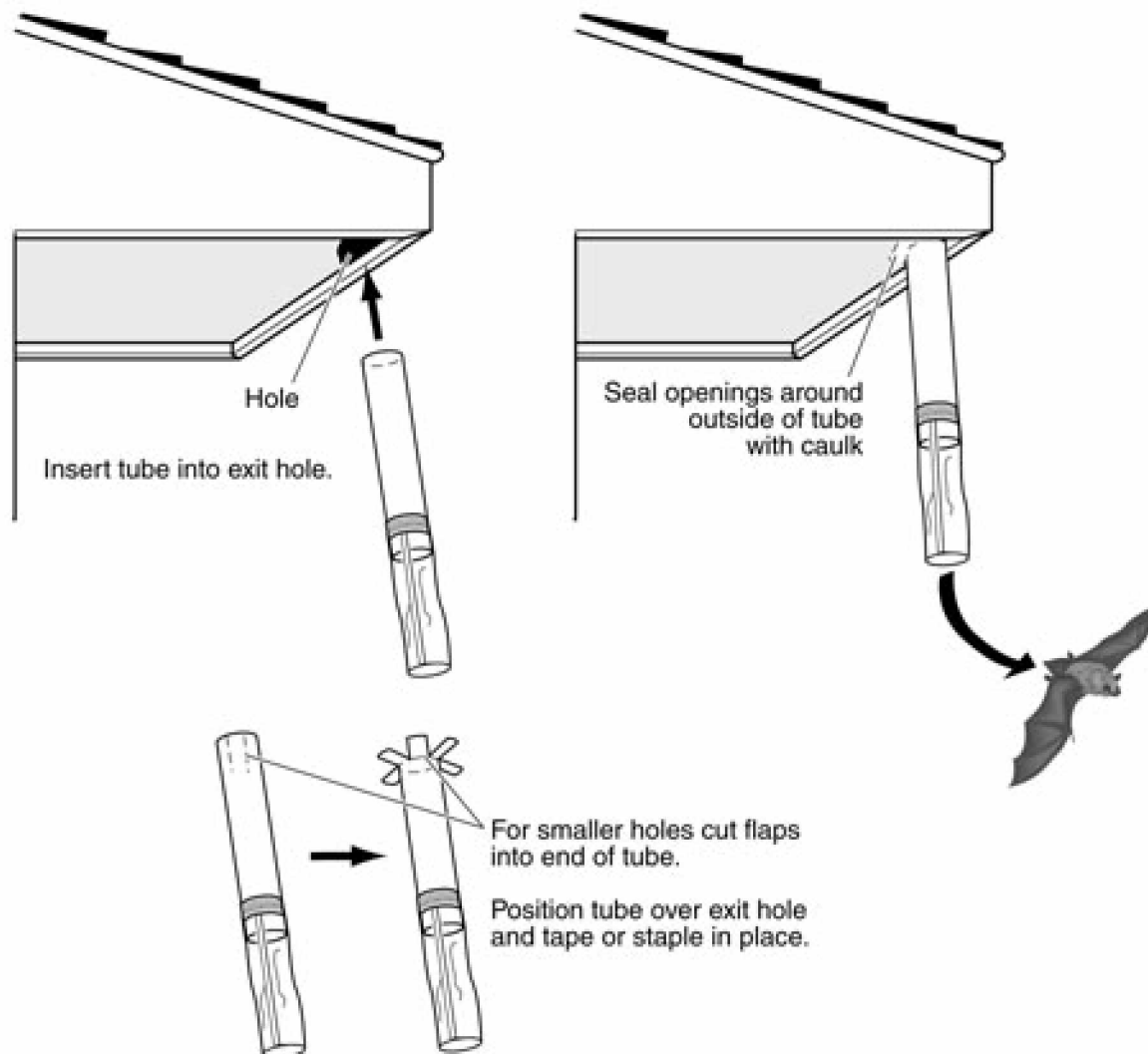
There are a number of situations in which tubes work best as bat exclusion devices. Examples include openings used by bats on buildings constructed from materials that do not create smooth exterior walls, such as those found on brick or stone houses, and log cabins. Tubes also work best for holes located at corners where walls meet and on horizontal surfaces such as soffits. Exclusion tubes should have a 2-inch (5 cm) diameter and be approximately 10 inches (25.4 cm) in length. Exclusion devices can be made from PVC pipe or flexible plastic tubing. According to Laura Finn of Fly by Night, Inc., empty caulking tubes work well for this purpose. When using

## Appendix H

caulking tubes, both ends must be cut out. Use of a flexible plastic tube makes it easy to either squeeze one end of the tube so that it fits into a crevice, or cut one end of the tube into flaps that can be fit over an opening and stapled, nailed, or taped to the building (see diagram). Bats are unable to cling to the smooth surface of these tubes. Do not let the tube project more than 1/4-inch (6 mm) into the opening, ensuring that bats can easily enter the tube to exit. Caulking tubes must be thoroughly cleaned before use to prevent bats from sticking to wet caulk and because dried caulk creates a roughened surface, making it possible for bats to re-enter. Once the tube has been inserted over the hole, a piece of light weight, clear plastic can be taped around the end of the tube that projects to the outside (see diagram) to further reduce the likelihood of bats reentering, though this is typically not necessary.

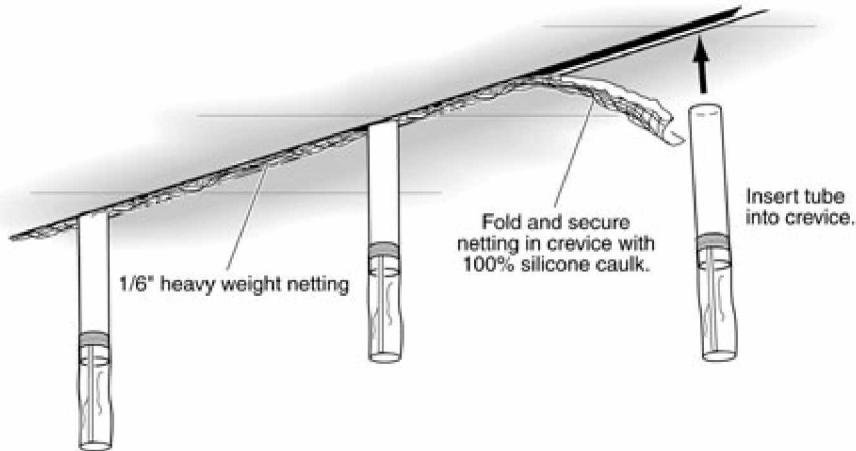


Plastic sleeves collapse on themselves, preventing bats from reentering once they have crawled out through the tube. After the tube has been inserted into or over the opening used by bats, any spaces between the outer rim of the tube and the building must be sealed shut. Be sure also to seal shut any other openings in the building that bats could use to reenter. Leave the tube in place for a minimum of five to seven days to ensure all bats have exited. After the bats have been excluded, the tube should be removed and the opening permanently sealed.



Some concrete parking garages have lengthy crevices used by bats. Multiple exclusion tubes will need to be placed every few feet along the length of each crevice; spaces between the tubes should be closed with heavy-weight (1/6 inch mesh) netting (see diagram). Fold the netting so that it fits into the crevice, and caulk it in place as shown in the diagram. The same procedure can be used in lengthy crevices created where flashing has pulled away from a wall.

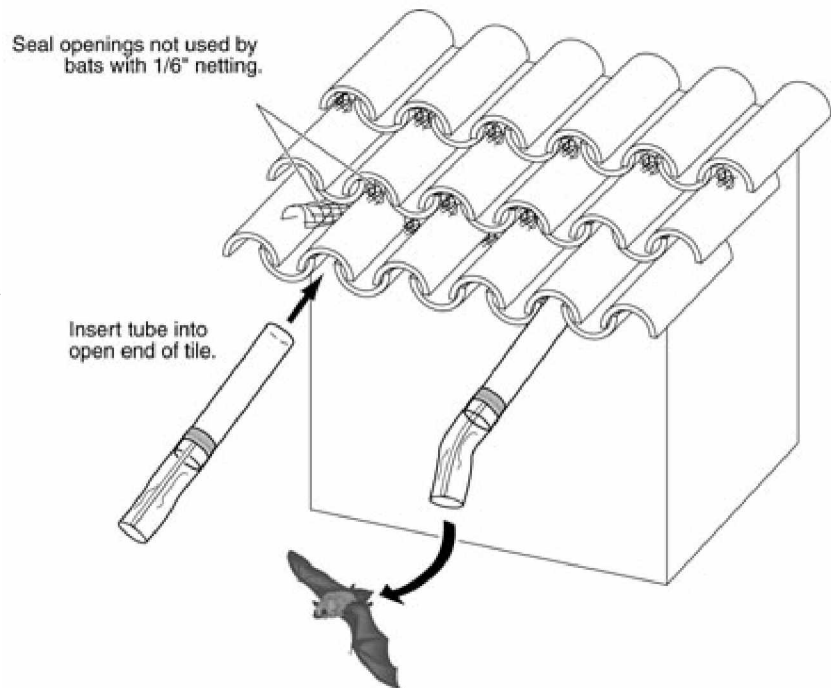




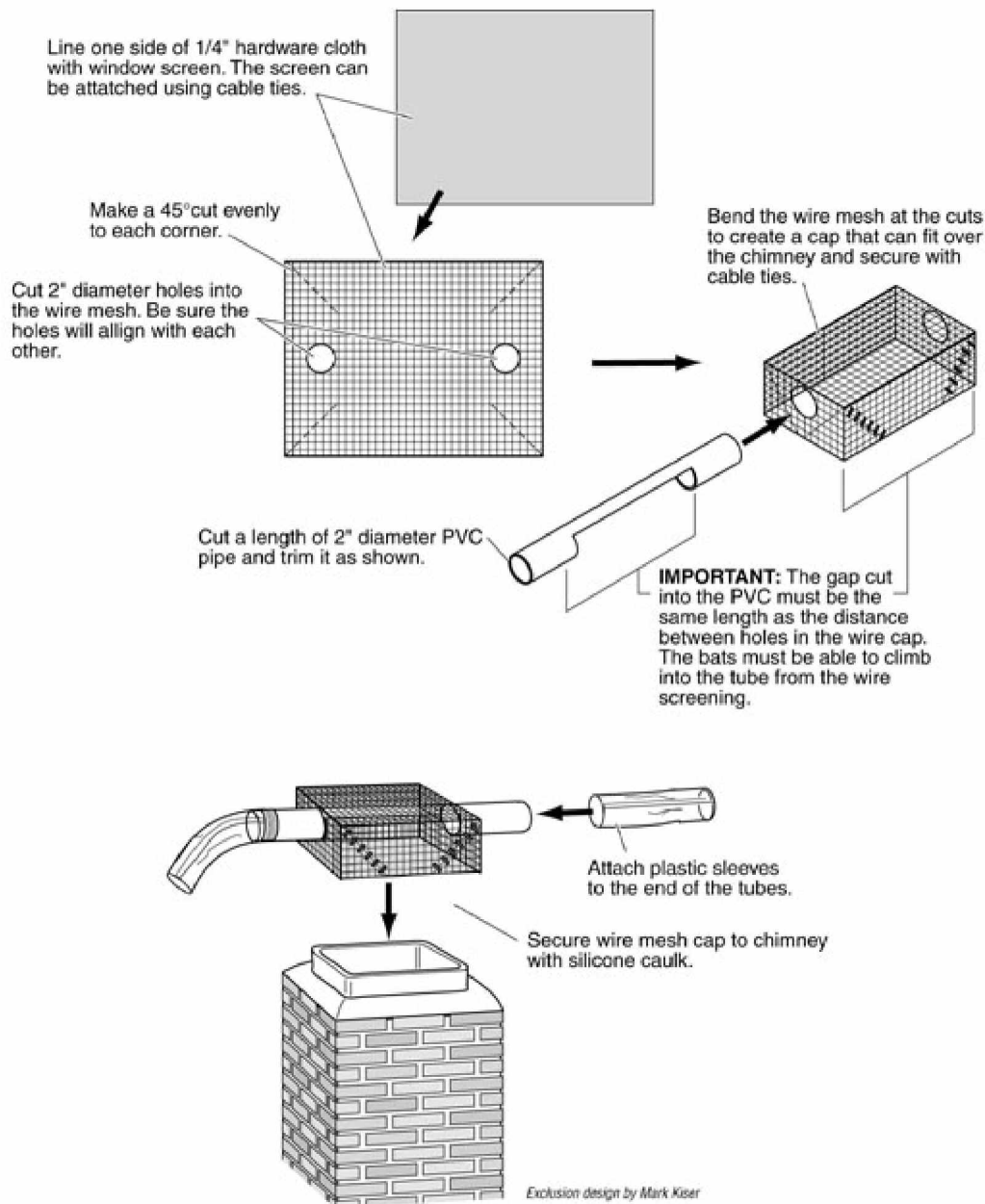
Plastic tubes also work best for excluding bats from under Spanish (clay) or concrete roofing tile. Bats typically enter through open ends of the tiles on the lowest row, or through openings created where tiles overlap one another. Observe the building when bats fly out in the evening to determine which openings they use. Exclusion tubes should be placed in these openings (see diagram). Multiple exclusion tubes are often needed to exclude bats from problem roofs. Collapsible plastic sleeves should also be attached to the ends of the tubes. Heavy weight netting can be folded and inserted into openings where tiles overlap (see diagram).

Tiles are sometimes temporarily removed to replace a layer of tar paper. When this is done, a layer of coarse fiberglass batting can be put over the tar paper and under the tiles. Constantine (1979) found that the fiberglass layer repelled bats, although he recommended against use of batting within 6 inches (15 cm) of open tile ends to prevent birds from pulling it out for nesting material.

Bats may also enter a building through spaces beneath corrugated or galvanized roofing sheets. These roofs can be sealed with a variety of materials such as caulk backing rod during months when bats are not present, or after they have been excluded from a building by use of exclusion tubes.



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Special modifications may be needed when bats roost in chimneys or in separations between chimneys and roofs. If bats are roosting inside the chimney, construct a wire cage from 1/4-inch hardware cloth lined with window screen. A section of PVC pipe can be cut and then inserted through holes cut into the sides of the wire cage (*see diagram*). Although bats are able to simply drop down and out of a vertically placed tube that extends below the roost, they are not able to grip the slick surface to crawl out if the tube extends upward above the roost. Therefore, the tubes should project horizontally or down. A collapsible plastic sleeve should be placed over the ends of all exclusion tubes used on chimneys. Once the bats have been excluded, a chimney cap should be installed.

## **Appendix H**

### **Bats Roosting on Porches at Night**

Bats sometimes roost on porches or under overhangs briefly during the night while they digest the insects they have eaten. Non-toxic aerosol dog or cat repellents may be used to discourage bats from roosting in these areas. The spray should be applied by day when bats are not present (Aerosol repellents are not an adequate substitute for exclusion in the case of day roosts and should never be applied when bats are in a roost.) Mylar balloons or strips of aluminum foil hung from the porch ceiling and allowed to move in the breeze may also discourage bats from roosting in that area.

### **Bat Houses**

It's always a good idea to provide bats with a new place to roost. For information on building or purchasing bat houses visit the North American Bat House Project Web site at [www.batcon.org/bhra](http://www.batcon.org/bhra).

**Compendium of Animal Rabies Prevention and Control, 2005\***  
**National Association of State Public Health Veterinarians, Inc. (NASPHV)**  
**(www.nasphv.org)**

Rabies is a fatal viral zoonosis and a serious public health problem.<sup>1</sup> The recommendations in this compendium serve as the basis for animal rabies prevention and control programs throughout the United States and facilitate standardization of procedures among jurisdictions, thereby contributing to an effective national rabies-control program. This document is reviewed annually and revised as necessary. Principles of rabies prevention and control are detailed in Part I; Part II contains recommendations for parenteral vaccination procedures; all animal rabies vaccines licensed by the United States Department of Agriculture (USDA) and marketed in the United States are listed in Part III.

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Council of State and Territorial Epidemiologists (CSTE)  
National Animal Control Association (NACA)

**Part I: Rabies Prevention and Control**

**A. PRINCIPLES OF RABIES PREVENTION AND CONTROL**

1. **RABIES EXPOSURE:** Rabies is transmitted only when the virus is introduced into bite wounds, open cuts in skin, or onto mucous membranes from saliva or other potentially infectious material such as neural tissue.<sup>2</sup> Questions about possible exposures should be directed to state or local health authorities.
2. **HUMAN RABIES PREVENTION:** Rabies in humans can be prevented either by eliminating exposures to rabid animals or by providing exposed persons with prompt local treatment of wounds combined with the administration of human rabies immune globulin and vaccine. The rationale for recommending preexposure and postexposure rabies prophylaxis and details of their administration can be found in the current recommendations of the Advisory Committee on Immunization Practices (ACIP).<sup>2</sup> These recommendations, along with information concerning the current local and regional epidemiology of animal rabies and the availability of human rabies biologics, are available from state health departments.
3. **DOMESTIC ANIMALS:** Local governments should initiate and maintain effective programs to ensure vaccination of all dogs, cats, and ferrets and to remove strays and unwanted animals. Such procedures in the United States have reduced laboratory-confirmed cases of rabies in dogs from 6,949 in 1947 to 117 in 2003.<sup>3</sup> Because more rabies cases are reported annually involving cats (321 in 2003) than dogs, vaccination of cats should be required. Animal shelters and animal control authorities should establish policies to ensure that adopted animals are vaccinated against rabies. The recommended vaccination procedures and the licensed animal vaccines are specified in Parts II and III of the Compendium.
4. **RABIES IN VACCINATED ANIMALS:** Rabies is rare in vaccinated animals.<sup>4</sup> If such an event is suspected it should be reported to state public health officials, the vaccine manufacturer, and to the USDA, Animal and Plant Health Inspection Service, Center for Veterinary Biologics ([www.aphis.usda.gov/vs/cvb/ic/adverseeventreport.htm](http://www.aphis.usda.gov/vs/cvb/ic/adverseeventreport.htm), by telephone at 800-752-6255, or by e-mail to [CVB@usda.gov](mailto:CVB@usda.gov)). The laboratory diagnosis should be confirmed and the virus characterized by a rabies reference laboratory. A thorough epidemiologic investigation should be conducted.
5. **RABIES IN WILDLIFE:** The control of rabies among wildlife reservoirs is difficult.<sup>5</sup> Vaccination of free-ranging wildlife or selective population reduction might be useful in some situations, but the success of such procedures depends on the circumstances surrounding each rabies outbreak (See Part I, C. Control Methods in Wildlife). Because of the risk of rabies in

wild animals (especially raccoons, skunks, coyotes, foxes, and bats), the AVMA, the NASPHV, and the CSTE strongly recommend the enactment and enforcement of state laws prohibiting their importation, distribution, and relocation.

6. **RABIES SURVEILLANCE:** Laboratory-based rabies surveillance is an essential component of rabies control and prevention programs. Accurate and timely information is necessary to guide human postexposure prophylaxis decisions, determine the management of potentially exposed animals, aid in emerging pathogen discovery; describe the epidemiology of the disease, and assess the need for and effectiveness of oral vaccination programs for wildlife.
7. **RABIES DIAGNOSIS:** Rabies testing should be performed by a qualified laboratory, designated by the local or state health department<sup>6</sup> in accordance with the established national standardized protocol for rabies testing ([www.cdc.gov/ncidod/dvrd/rabies/Professional/publications/DFA\\_diagnosis/DFA\\_protocol-b.htm](http://www.cdc.gov/ncidod/dvrd/rabies/Professional/publications/DFA_diagnosis/DFA_protocol-b.htm)). Euthanasia<sup>7</sup> should be accomplished in such a way as to maintain the integrity of the brain so that the laboratory can recognize the anatomical parts. Except in the case of very small animals, such as bats, only the head or brain (including brain stem) should be submitted to the laboratory. Any animal or animal specimen being submitted for testing should be kept under refrigeration (not frozen or chemically fixed) during storage and shipping.
8. **RABIES SEROLOGY:** Some “rabies-free” jurisdictions may require evidence of vaccination and rabies antibodies for importation purposes. Rabies antibody titers are indicative of an animal’s response to vaccine or infection. Titers do not directly correlate with protection because other immunologic factors also play a role in preventing rabies, and our abilities to measure and interpret those other factors are not well developed. Therefore, evidence of circulating rabies virus antibodies should **not** be used as a substitute for current vaccination in managing rabies exposures or determining the need for booster vaccinations in animals.<sup>8</sup>

## B. PREVENTION AND CONTROL METHODS IN DOMESTIC AND CONFINED ANIMALS

1. **PREEXPOSURE VACCINATION AND MANAGEMENT:** Parenteral animal rabies vaccines should be administered only by or under the direct supervision of a veterinarian. Rabies vaccinations may also be administered under the supervision of a veterinarian to animals held in animal control shelters prior to release. Any veterinarian signing a rabies certificate must assure that the person administering vaccine is identified on the certificate and is appropriately trained in vaccine storage, handling, administration, management of adverse events, etc. This practice ensures that a qualified and responsible person can be held accountable to assure that the animal has been properly vaccinated.

Within twenty-eight (28) days after primary vaccination, a peak rabies antibody titer is reached and the animal can be considered immunized. An animal is currently vaccinated and is considered immunized if the primary vaccination was administered at least 28 days previously and vaccinations have been administered in accordance with this Compendium.

Regardless of the age of the animal at initial vaccination, a booster vaccination should be administered 1 year later (See Parts II and III for vaccines and procedures). There are no laboratory or epidemiologic data to support the annual or biennial administration of 3-year vaccines following the initial series. Because a rapid anamnestic response is expected, an animal is considered currently vaccinated immediately after a booster vaccination.

### (a) DOGS, CATS, AND FERRETS

All dogs, cats, and ferrets should be vaccinated against rabies and revaccinated in accordance with Part III of this Compendium. If a previously vaccinated animal is overdue for a booster, it should be revaccinated. Immediately following the booster, the animal is considered currently vaccinated and should be placed on an annual or triennial schedule depending on the type of vaccine used.

### (b) LIVESTOCK

Consideration should be given to vaccinating livestock that are particularly valuable or that might have frequent contact with humans (e.g., in petting zoos, fairs, and other public exhibitions; see *The Compendium of Measures to Prevent Disease and Injury Associated with Animals in Public Settings* at [www.nasphv.org](http://www.nasphv.org)).<sup>9</sup> Horses traveling interstate should be currently vaccinated against rabies.

### (c) CONFINED ANIMALS

#### (1) WILD

No parenteral rabies vaccines are licensed for use in wild animals or hybrids. Wild animals or hybrids should not be kept as pets.<sup>10-13</sup>

(2) **MAINTAINED IN EXHIBITS AND IN ZOOLOGICAL PARKS**

Captive mammals that are not completely excluded from all contact with rabies vectors can become infected. Moreover, wild animals might be incubating rabies when initially captured; therefore, wild-caught animals susceptible to rabies should be quarantined for a minimum of 6 months before being exhibited. Employees who work with animals at such facilities should receive preexposure rabies vaccination. The use of pre- or postexposure rabies vaccinations for employees who work with animals at such facilities might reduce the need for euthanasia of captive animals. Carnivores and bats should be housed in a manner that precludes direct contact with the public.

2. **STRAY ANIMALS:** Stray dogs, cats, and ferrets should be removed from the community. Local health departments and animal control officials can enforce the removal of strays more effectively if owned animals have identification and are confined or kept on leash. Strays should be impounded for at least 3 business days to determine if human exposure has occurred and to give owners sufficient time to reclaim animals.

3. **IMPORTATION AND INTERSTATE MOVEMENT OF ANIMALS:**

- (a) **INTERNATIONAL.** CDC regulates the importation of dogs and cats into the United States. Importers of dogs must comply with rabies vaccination requirements (42 CFR, Part 71.51[c], [www.cdc.gov/ncidod/dq/animal.htm](http://www.cdc.gov/ncidod/dq/animal.htm)) and complete the CDC form 75.37 ([www.cdc.gov/ncidod/dq/pdf/cdc7537-05-24-04.pdf](http://www.cdc.gov/ncidod/dq/pdf/cdc7537-05-24-04.pdf)). The appropriate health official of the state of destination should be notified within 72 hours of the arrival into his or her jurisdiction of any imported dog required to be placed in confinement under the CDC regulation. Failure to comply with these requirements should be promptly reported to the Division of Global Migration and Quarantine, CDC, (404) 498-1670.

Federal regulations alone are insufficient to prevent the introduction of rabid animals into the country.<sup>14,15</sup> All imported dogs and cats are subject to state and local laws governing rabies and should be currently vaccinated against rabies in accordance with this Compendium. Failure to comply with state or local requirements should be referred to the appropriate state or local official.

- (b) **INTERSTATE.** Before interstate (including commonwealths and territories) movement, dogs, cats, ferrets, and horses should be currently vaccinated against rabies in accordance with the Compendium's recommendations (See Part I, B.1. Preexposure Vaccination and Management). Animals in transit should be accompanied by a currently valid NASPHV Form #51 ([www.nasphv.org/83416/106001.html](http://www.nasphv.org/83416/106001.html)), Rabies Vaccination Certificate. When an interstate health certificate or certificate of veterinary inspection is required, it should contain the same rabies vaccination information as Form #51.
- (c) **AREAS WITH DOG-TO-DOG RABIES TRANSMISSION.** The movement of dogs from areas with dog-to-dog rabies transmission for the purpose of adoption or sale should be eliminated. Rabid dogs have been introduced into the United States from areas with dog-to-dog rabies transmission.<sup>14,15</sup> This practice poses the risk of introducing canine-transmitted rabies to areas where it does not currently exist.

4. **ADJUNCT PROCEDURES:** Methods or procedures which enhance rabies control include the following:

- (a) **IDENTIFICATION.** Dogs, cats, and ferrets should be identified (e.g., metal or plastic tags, microchips, etc.) to allow for verification of rabies vaccination status.
- (b) **LICENSURE.** Registration or licensure of all dogs, cats, and ferrets may be used to aid in rabies control. A fee is frequently charged for such licensure and revenues collected are used to maintain rabies- or animal-control programs. Evidence of current vaccination is an essential prerequisite to licensure.
- (c) **CANVASSING.** House-to-house canvassing by animal control officials facilitates enforcement of vaccination and licensure requirements.
- (d) **CITATIONS.** Citations are legal summonses issued to owners for violations, including the failure to vaccinate or license their animals. The authority for officers to issue citations should be an integral part of each animal-control program.
- (e) **ANIMAL CONTROL.** All communities should incorporate stray animal control, leash laws, and training of personnel in their programs.

5. **POSTEXPOSURE MANAGEMENT:** Any animal potentially exposed to rabies virus (See Part I, A.1. Rabies Exposure) by a wild, carnivorous mammal or a bat that is not available for testing should be regarded as having been exposed to rabies.

- (a) **DOGS, CATS, AND FERRETS.** Unvaccinated dogs, cats, and ferrets exposed to a rabid animal should be euthanized immediately. If the owner is unwilling to have this done, the animal should be placed in strict isolation for 6 months. Rabies vaccine should be administered upon entry into isolation or 1 month prior to release to comply with preexposure

vaccination recommendations (See Part I.B.1.(a)). Protocols for the postexposure vaccination of previously unvaccinated domestic animals have not been validated, and there is evidence that the use of vaccine alone will not prevent the disease.<sup>16</sup> Animals with expired vaccinations need to be evaluated on a case-by-case basis. Dogs, cats, and ferrets that are currently vaccinated should be revaccinated immediately, kept under the owner's control, and observed for 45 days. Any illness in an isolated or confined animal should be reported immediately to the local health department.

- (b) **LIVESTOCK.** All species of livestock are susceptible to rabies; cattle and horses are among the most frequently diagnosed. Livestock exposed to a rabid animal and currently vaccinated with a vaccine approved by USDA for that species should be revaccinated immediately and observed for 45 days. Unvaccinated livestock should be slaughtered immediately. If the owner is unwilling to have this done, the animal should be kept under close observation for 6 months. Any illness in an animal under observation should be reported immediately to the local health department.

The following are recommendations for owners of livestock exposed to rabid animals:

- (1) If the animal is slaughtered within 7 days of being bitten, its tissues may be eaten without risk of infection, provided that liberal portions of the exposed area are discarded. Federal guidelines for meat inspectors require that any animal known to have been exposed to rabies within 8 months be rejected for slaughter.
  - (2) Neither tissues nor milk from a rabid animal should be used for human or animal consumption.<sup>17</sup> Pasteurization temperatures will inactivate rabies virus, therefore, drinking pasteurized milk or eating cooked meat does not constitute a rabies exposure.
  - (3) Having more than one rabid animal in a herd or having herbivore-to-herbivore transmission is uncommon; therefore, restricting the rest of the herd if a single animal has been exposed to or infected by rabies might not be necessary.
- (c) **OTHER ANIMALS.** Other mammals bitten by a rabid animal should be euthanized immediately. Animals maintained in USDA licensed research facilities or accredited zoological parks should be evaluated on a case-by-case basis.

## **6. MANAGEMENT OF ANIMALS THAT BITE HUMANS:**

- (a) **DOGS, CATS, AND FERRETS.** Rabies virus may be excreted in the saliva of infected dogs, cats, and ferrets during illness and/or for only a few days prior to illness or death.<sup>18-20</sup> A healthy dog, cat, or ferret that bites a person should be confined and observed daily for 10 days.<sup>21</sup> During the observation period, administration of rabies vaccine to the animal is not recommended to avoid confusing signs of rabies with possible side effects of vaccine administration. Animals should be evaluated by a veterinarian at the first sign of illness during confinement. Any illness in the animal should be reported immediately to the local health department. If signs suggestive of rabies develop, the animal should be euthanized and the head shipped for testing as described in Part I.A.7. Any stray or unwanted dog, cat, or ferret that bites a person may be euthanized immediately and the head submitted for rabies examination.
- (b) **OTHER BITING ANIMALS.** Other biting animals which might have exposed a person to rabies should be reported immediately to the local health department. Management of animals other than dogs, cats, and ferrets depends on the species, the circumstances of the bite, the epidemiology of rabies in the area, the biting animal's history, current health status, and potential for exposure to rabies. Prior vaccination of these animals may not preclude the necessity for euthanasia and testing.

**C. PREVENTION AND CONTROL METHODS RELATED TO WILDLIFE:** The public should be warned not to handle or feed wild mammals. Wild mammals and hybrids that bite or otherwise expose persons, pets, or livestock should be considered for euthanasia and rabies examination. A person bitten by any wild mammal should immediately report the incident to a physician who can evaluate the need for antirabies treatment (See current rabies prophylaxis recommendations of the ACIP<sup>2</sup>). State regulated wildlife rehabilitators may play a role in a comprehensive rabies control program. Minimum standards for persons who rehabilitate wild mammals should include rabies vaccination, appropriate training and continuing education. Translocation of infected wildlife has contributed to the spread of rabies,<sup>22,23</sup> therefore, the translocation of known terrestrial rabies reservoir species should be prohibited.

- 1. TERRESTRIAL MAMMALS:** The use of licensed oral vaccines for the mass vaccination of free-ranging wildlife should be considered in selected situations, with the approval of the state agency responsible for animal rabies control.<sup>5</sup> The distribution of oral rabies vaccine should be based on scientific assessments of the target species and followed by timely and appropriate analysis of surveillance data; such results should be provided to all stakeholders. In addition, parenteral vaccination (trap-vaccinate-release) of wildlife rabies reservoirs may be integrated into coordinated oral rabies vaccination programs to enhance their effectiveness. Continuous and persistent programs for trapping or poisoning wildlife are not effective in reducing wildlife rabies reservoirs on a statewide basis. However, limited population control in high-contact areas (e.g., picnic grounds, camps, suburban areas) may be indicated for the removal of selected high-risk species of

wildlife.<sup>5</sup> State agriculture, public health, and wildlife agencies should be consulted for planning, coordination, and evaluation of vaccination or population-reduction programs.

2. **BATS:** Indigenous rabid bats have been reported from every state except Hawaii, and have caused rabies in at least 40 humans in the United States.<sup>24-28</sup> Bats should be excluded from houses, public buildings, and adjacent structures to prevent direct association with humans.<sup>29,30</sup> Such structures should then be made bat-proof by sealing entrances used by bats. Controlling rabies in bats through programs designed to reduce bat populations is neither feasible nor desirable.

## Part II: Recommendations for Parenteral Rabies Vaccination Procedures

- A. **VACCINE ADMINISTRATION:** All animal rabies vaccines should be restricted to use by, or under the direct supervision of a veterinarian,<sup>31</sup> except as recommended in Part I.B.1. All vaccines must be administered in accordance with the specifications of the product label or package insert.
- B. **VACCINE SELECTION:** Part III lists all vaccines licensed by USDA and marketed in the United States at the time of publication. New vaccine approvals or changes in label specifications made subsequent to publication should be considered as part of this list. Any of the listed vaccines can be used for revaccination, even if the product is not the same brand previously administered. Vaccines used in state and local rabies control programs should have a 3-year duration of immunity. This constitutes the most effective method of increasing the proportion of immunized dogs and cats in any population.<sup>32</sup> There are no laboratory or epidemiologic data to support the annual or biennial administration of 3-year vaccines following the initial series.
- C. **ADVERSE EVENTS:** Currently, no epidemiologic association exists between a particular licensed vaccine product and adverse events including vaccine failure.<sup>33,34</sup> Adverse events should be reported to the vaccine manufacturer and to the USDA, Animal and Plant Health Inspection Service, Center for Veterinary Biologics ([www.aphis.usda.gov/vs/cvb/ic/adverseeventreport.htm](http://www.aphis.usda.gov/vs/cvb/ic/adverseeventreport.htm), by telephone at 800-752-6255, or by e-mail to [CVB@usda.gov](mailto:CVB@usda.gov)).
- D. **WILDLIFE AND HYBRID ANIMAL VACCINATION:** The safety and efficacy of parenteral rabies vaccination of wildlife and hybrids (the offspring of wild animals crossbred to domestic animals) have not been established, and no rabies vaccines are licensed for these animals. Parenteral vaccination (trap-vaccinate-release) of wildlife rabies reservoirs may be integrated into coordinated oral rabies vaccination programs as described in Part I, C.1. to enhance their effectiveness. Zoos or research institutions may establish vaccination programs, which attempt to protect valuable animals, but these should not replace appropriate public health activities that protect humans.<sup>9</sup>
- E. **ACCIDENTAL HUMAN EXPOSURE TO VACCINE:** Human exposure to parenteral animal rabies vaccines listed in Part III does not constitute a risk for rabies infection. However, human exposure to vaccinia-vectored oral rabies vaccines should be reported to state health officials.<sup>35</sup>
- F. **RABIES CERTIFICATE:** All agencies and veterinarians should use the NASPHV Form #51, "Rabies Vaccination Certificate," which can be obtained from vaccine manufacturers or the NASPHV website ([www.nasphv.org](http://www.nasphv.org)). The form must be completed in full and signed by the administering or supervising veterinarian. Computer-generated forms containing the same information are acceptable.

## Part III: Rabies Vaccines Licensed and Marketed in the U.S., 2005

Product Name	Produced by	Marketed by	For Use In	Dosage	Age at Primary Vaccination <sup>a</sup>	Booster Recommended	Route of Inoculation
<b>A) MONOVALENT (Inactivated)</b>							
DEFENSOR 1	Pfizer, Incorporated License No. 189	Pfizer, Incorporated	Dogs Cats	1 ml 1 ml	3 months <sup>b</sup> 3 months	Annually Annually	IM <sup>c</sup> or SC <sup>d</sup> SC
DEFENSOR 3	Pfizer, Incorporated License No. 189	Pfizer, Incorporated	Dogs Cats Sheep Cattle	1 ml 1 ml 2 ml 2 ml	3 months 3 months 3 months 3 months	1 year later & triennially 1 year later & triennially Annually Annually	IM or SC SC IM IM
RABDOMUN	Pfizer, Incorporated License No. 189	Schering-Plough	Dogs Cats Sheep Cattle	1 ml 1 ml 2 ml 2 ml	3 months 3 months 3 months 3 months	1 year later & triennially 1 year later & triennially Annually Annually	IM or SC SC IM IM
RABDOMUN 1	Pfizer, Incorporated License No. 189	Schering-Plough	Dogs Cats	1 ml 1 ml	3 months 3 months	Annually Annually	IM or SC SC
RABVAC 1	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Dogs Cats	1 ml 1 ml	3 months 3 months	Annually Annually	IM or SC IM or SC
RABVAC 3	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Dogs Cats Horses	1 ml 1 ml 2 ml	3 months 3 months 3 months	1 year later & triennially 1 year later & triennially Annually	IM or SC IM or SC IM



Product Name	Produced by	Marketed by	For Use In	Dosage	Age at Primary Vaccination <sup>a</sup>	Booster Recommended	Route of Inoculation
<b>A) MONOVALENT (Inactivated) continued</b>							
RABVAC 3 TF	Fort Dodge Animal Health License No. 112	Fort Dodge Animal Health	Dogs Cats Horses	1 ml 1 ml 2 ml	3 months 3 months 3 months	1 year later & triennially 1 year later & triennially Annually	IM or SC IM or SC IM
PRORAB-1	Intervet, Incorporated License No. 286	Intervet, Incorporated	Dogs Cats Sheep	1 ml 1 ml 2 ml	3 months 3 months 3 months	Annually Annually Annually	IM or SC IM or SC IM
PRORAB-3F	Intervet, Incorporated License No. 286	Intervet, Incorporated	Cats	1 ml	3 months	1 year later & triennially	IM or SC
IMRAB 3	Merial, Incorporated License No. 298	Merial, Incorporated	Dogs Cats Sheep Cattle Horses Ferrets	1 ml 1 ml 2 ml 2 ml 2 ml 1 ml	3 months 3 months 3 months 3 months 3 months 3 months	1 year later & triennially 1 year later & triennially 1 year later & triennially Annually Annually Annually	IM or SC IM or SC IM or SC IM or SC IM or SC SC
IMRAB 3 TF	Merial, Incorporated License No. 298	Merial, Incorporated	Dogs Cats Ferrets	1 ml 1 ml 1 ml	3 months 3 months 3 months	1 year later & triennially 1 year later & triennially Annually	IM or SC IM or SC SC
IMRAB Large Animal	Merial, Incorporated License No. 298	Merial, Incorporated	Cattle Horses Sheep	2 ml 2 ml 2 ml	3 months 3 months 3 months	Annually Annually 1 year later & triennially	IM or SC IM or SC IM or SC
IMRAB 1	Merial, Incorporated License No. 298	Merial, Incorporated	Dogs Cats	1 ml 1 ml	3 months 3 months	Annually Annually	SC SC
<b>B) MONOVALENT (Rabies glycoprotein, live canary pox vector)</b>							
PUREVAX Feline Rabies	Merial, Incorporated License No. 298	Merial, Incorporated	Cats	1ml	8 weeks	Annually	SC
<b>C) COMBINATION (Inactivated rabies)</b>							
Equine POTOMAVAC + IMRAB	Merial, Incorporated License No. 298	Merial, Incorporated	Horses	1 ml	3 months	Annually	IM
MYSTIQUE II	Intervet, Incorporated License No. 286	Intervet, Incorporated	Horses	1 ml	3 months	Annually	IM
<b>D) COMBINATION (Rabies glycoprotein, live canary pox vector)</b>							
PUREVAX Feline 3/ Rabies	Merial, Incorporated License No. 298	Merial, Incorporated	Cats	1ml	8 weeks	Annually	SC
PUREVAX Feline 4/ Rabies	Merial, Incorporated License No. 298	Merial, Incorporated	Cats	1ml	8 weeks	Annually	SC
<b>E) ORAL (Rabies glycoprotein, live vaccinia vector) - RESTRICTED TO USE IN STATE AND FEDERAL RABIES CONTROL PROGRAMS</b>							
RABORAL V-RG	Merial, Incorporated License No. 298	Merial, Incorporated	Raccoons Coyotes	N/A	N/A	As determined by local authorities	Oral

a. Minimum age (or older) and revaccinated one year later.

b. One month = 28 days

c. Intramuscularly

d. Subcutaneously

## REFERENCES

1. Rabies. In: Chin J, ed. *Control of Communicable Diseases Manual*, 17<sup>th</sup> ed. Washington, DC: American Public Health Association, 2000:411-419.
2. CDC. Human rabies prevention-United States, 1999. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1999; 48:(No. RR-1).
3. Krebs JW, et al. Rabies Surveillance in the United States during 2003. *J Am Vet Med Assoc* 2004
4. McQuiston J, et al. Epidemiologic characteristics of rabies virus variants in dogs and cats in the United States, 1999. *J Am Vet Med Assoc* 2001; 218:1939-1942.
5. Hanlon CA, Childs JE, Nettles VF, et al. Recommendations of the Working Group on Rabies, Article III: Rabies in wildlife. *J Am Vet Med Assoc* 1999; 215:1612-1618.
6. Hanlon CA, Smith JS, Anderson, GR, et al. Recommendations of the Working Group on Rabies, Article II: Laboratory diagnosis of rabies. *J Am Vet Med Assoc* 1999; 215:1444-1446.
7. 2000 Report of the AVMA Panel on Euthanasia. *J Am Vet Med Assoc* 2001; 218:5,669-696.
8. Tizard I, Ni Y. Use of serologic testing to assess immune status of companion animals. *J Am Vet Med Assoc* 1998; 213:54-60.
9. Bender J, Schulman S, et al. Reports of zoonotic disease outbreaks associated with animal exhibits and availability of recommendations for preventing zoonotic disease transmission from animals to people in such settings. *J Am Vet Med Assoc* 2004; 224:1105-1109.
10. Wild Animals as Pets. In: Directory and resource manual. Schaumburg, IL: American Veterinary Medical Association 2002:126.
11. Position on Canine Hybrids. In: Directory and resource manual. Schaumburg, IL: American Veterinary Medical Association 2002:88-89.
12. Siino BS. Crossing the line. American Society for the Prevention of Cruelty to Animals Animal Watch 2000; Winter:22-29.
13. Jay MT, Reilly KF, DeBess EE, Haynes EH, Bader DR, Barrett LR. Rabies in a vaccinated wolf-dog hybrid. *J Am Vet Med Assoc* 1994; 205:1729-1732.
14. CDC. An imported case of rabies in an immunized dog. *MMWR* 1987, 36:94-96,101.
15. CDC. Imported dog and cat rabies – New Hampshire, California. *MMWR* 1988, 37:559-560.
16. Hanlon CA, Niezgoda MN, Rupprecht CE. Postexposure prophylaxis for prevention of rabies in dogs. *Am J Vet Res* 2002; 63:1096-1100.
17. CDC. Mass treatment of humans who drank unpasteurized milk from rabid cows-Massachusetts, 1996-1998. *MMWR* 1999; 48:228-229.
18. Vaughn JB, Gerhardt P, Paterson J. Excretion of street rabies virus in saliva of cats. *J Am Med Assoc* 1963, 184:705.
19. Vaughn JB, Gerhardt P, Newell KW. Excretion of street rabies virus in saliva of dogs. *J Am Med Assoc* 1965, 193:363-368.
20. Niezgoda M, Briggs DJ, Shaddock J, Rupprecht CE. Viral excretion in domestic ferrets (*Mustela putorius furo*) inoculated with a raccoon rabies isolate. *Am J Vet Res* 1998, 59:1629-1632.
21. Tepsumethanon V, Lumlerdacha B, Mitmoonpitak C, Sitprija V, Meslin FX, Wilde H. Survival of naturally infected rabid dogs and cats. *Clin Infect Dis*. 2004; 39:278-80.
22. Jenkins SR, Perry BD, Winkler WG. Ecology and epidemiology of raccoon rabies. *Rev Inf Dis* 1988; 10:Suppl 4:S620-S625.
23. CDC. Translocation of Coyote Rabies – Florida, 1994. *MMWR* 44:580-587.
24. Messenger SL, Smith JS, Rupprecht CE. Emerging epidemiology of bat-associated cryptic cases of rabies in humans in the United States. *Clin Inf Dis* 2002; 35:738-747.
25. CDC. Human Rabies - California, 2002. *MMWR* 51:686-688.
26. CDC. Human Rabies - Tennessee, 2002. *MMWR* 51:828-829.
27. CDC. Human Rabies - Iowa, 2002. *MMWR* 52:47-48.
28. CDC. Human Death Associated with Bat Rabies - California, 2003. *MMWR* 53:33-35.
29. Frantz SC, Trimarchi CV. Bats in human dwellings: health concerns and management In: Decker DF, ed. Proceedings of the first eastern wildlife damage control conference. Ithaca, NY: Cornell University, 1983: 299-308.
30. Greenhall AM. House bat management. US Fish and Wildlife Service, Resource Publication 143, 1982.
31. Model rabies control ordinance. In: Directory and resource manual. Schaumburg, IL: American Veterinary Medical Association, 2002:114-116.
32. Bunn TO. Canine and feline vaccines, past and present. In Baer GM, ed. *The Natural History of Rabies*, 2<sup>nd</sup> ed. Boca Raton, FL: CRC Press, 1991:415-425.
33. Gobar GM, Kass PH. World Wide Web-based survey of vaccination practices, postvaccinal reactions, and vaccine site-associated sarcomas in cats, *J Am Vet Med Assoc* 2002; 220:1477-1482
34. Macy DW, Hendrick MJ. The potential role of inflammation in the development of postvaccinal sarcomas in cats. *Vet Clin North Am Small Anim Pract* 1996; 26:103-109.
35. Rupprecht CE, Blass L, Smith K et al. Human infection due to recombinant vaccinia-rabies glycoprotein virus. *N Engl J Med* 2001; 345:582-586.

# Appendix J

## RABIES VACCINATION CERTIFICATE

NASPHV Form 51				RABIES TAG NUMBER	
Owner's Name & Address      Print – use ball point pen or type					
PRINT LAST		FIRST		M.I.	
TELEPHONE					
NO.		STREET		CITY	
STATE		ZIP			
SPECIES: Dog Cat Other: (specify)	SEX: Male Female Neutered	AGE: 3 Mo. To 12 Mo. 12 Mo. Or older	SIZE: Under 20 lbs. 20 – 50 lbs. Over 50 lbs.	PREDOMINANT BREED:  Name:	COLORS:  
DATE VACCINATED:  _____, 20____ Month      Day		PRODUCER <div style="border: 1px solid black; width: 100px; height: 30px; margin: 5px auto;"></div> (First 3 letters)		Veterinarian's: # _____ License No. _____	
VACCINATION EXPIRES:  _____, 20____ Month      Day		1 yr. Lic./Vacc. 3 yr. Lic./Vacc.  _____ Vacc. Serial (lot) Number		Signature _____ Address _____	

## Appendix K

### MODEL RABIES CONTROL ORDINANCE For MAINE MUNICIPALITIES

(Adapted from American Veterinary Medical Association's Model Rabies Control Ordinance)

#### Section I - Definitions

For the purpose of this ordinance, the following definitions shall prevail:

- A. Animal - any of the order *Mammalia*, all of which are capable of being infected with and transmitting rabies.
- B. Cat - any domestic feline animal (*Felis catus*).
- C. Dog - any domestic canine animal (*Canis familiaris*).
- D. Bite or Bitten - means that the skin has been penetrated by an animal's teeth.
- E. Isolation - confinement of an animal exposed or potentially exposed to rabies.
- F. Non-bite Exposure - means that saliva from an animal has come in contact with an open wound or a mucous membrane.
- G. Own - to keep, harbor, or have control, charge, or custody of an animal.
- H. Owner - any person who keeps, harbors, or has charge or control of, or permits any animal to habitually be or remain on, or be lodged or fed within his or her house, yard, or premises. This term shall not apply to veterinarians or kennel operators who have temporary custody, for a period of less than 60 days, of animals owned by others.
- I. Animal Shelter - a public facility that is maintained by a government entity, or a private facility providing contractual services to a government entity for the purpose of impounding or harboring animals.
- J. Quarantine - the strict confinement of an animal in a manner which precludes direct contact with other animals not concurrently in quarantine or persons other than the owner or caretaker. The quarantine shall be conducted under an order issued by the Public Health Official or the Rabies Control Authority designating the specific place, manner and provisions of the quarantine.
- K. Rabies Control Authority - a government agency or persons who are legally authorized and responsible for enforcement of this ordinance.
- L. Currently Vaccinated Against Rabies describes an animal that has received a primary rabies vaccine no less than 30 days previously, or has received a booster vaccine, administered in accordance with the current *Compendium of Animal Rabies* Prevention and Control prepared and updated annually by the National Association of State Public Health Veterinarians. Rabies vaccination must be performed by or under the direct supervision of a veterinarian who is licensed or legally permitted to practice veterinary medicine in the state.

#### Section II - Rabies Vaccination Requirements

- A. Initial Vaccination:  
Effective \_\_\_\_\_ in the (city, town, village, or county) of \_\_\_\_\_, the owner of every dog or cat 3 months of age or older shall have the animal vaccinated against rabies. Vaccination at a younger age should be in accordance with the labels of USDA licensed rabies vaccines. Unvaccinated dogs and cats more than 3 months of age, that are acquired or

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moved into the (city, town, village, or county) must be vaccinated within 30 days of purchase or arrival, unless there is documented evidence of current vaccination.

### B. Revaccination:

The owner of every dog or cat shall have the animal revaccinated 12 months after the initial vaccination. Thereafter, the interval between revaccinations should conform to the manufacturer's written instructions (every 12 months for annual vaccines and every 36 months for triennial vaccines).

## Section III - Duties

### A. Duties of Veterinarian

It shall be the duty of each veterinarian, when vaccinating any dog or cat to complete a certificate of rabies vaccination (or generate a computer print out) for each dog or cat that is vaccinated. The certificate shall include the following information:

1. Owner's name, address, and telephone number
2. Description of the dog or cat (species, breed, sex, markings, age, and name)
3. Date of vaccination
4. Date of vaccination expiration
5. Rabies vaccination tag number
6. Vaccine producer and product name
7. Manufacturer's serial or lot number of vaccine
8. Veterinarian's signature
9. Veterinarian's address and license number

The original certificate of rabies vaccination shall be provided to the owner. The veterinarian who administers the vaccination shall retain one copy. All parties should retain the certificate for the duration of the vaccination plus one year. A durable metal or plastic, serially numbered rabies tag issued by the veterinarian who administers the vaccine shall be provided to the owner with instructions that it must be securely attached to the dog's or cat's collar or harness.

### B. Duties of Owner

The owner is responsible to procure rabies vaccination for his or her dog or cat as outlined above, and to secure a license. The owner is responsible to assure that his or her dog or cat wears a collar or harness with identification and the approved license or rabies tag securely attached. The license or rabies tag shall be worn at all times unless specific exemptions are set forth in the local ordinance.

## Section IV - Transient or Show Dogs or Cats

Owners of dogs or cats who are temporarily visiting a specific rabies control jurisdiction with their dog(s) or cat(s) or who are exhibiting a dog or cat in competition, must carry with them and be prepared, upon demand of a legal authority, to present a current certificate of rabies vaccination for each dog or cat.

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### Section V - Management of Animals that Bite Humans

Anyone knowing of an animal bite to a human shall immediately report the bite to the Rabies Control Authority or the Public Health Official.

#### A. Vaccinated Dogs, Cats, and Ferrets

1. A healthy dog, cat, or ferret that is currently vaccinated against rabies and that bites or reportedly bites a human will be examined by a licensed veterinarian, who will determine the animal's health status. If no signs of illness compatible with rabies are detected, the animal will be quarantined under such conditions as are outlined in an official quarantine order issued by the Rabies Control Authority or Public Health Official and observed for a period of 10 days from the date of the bite. Instead of being quarantined, the animal may be humanely euthanized and tested for rabies in an approved laboratory.

Quarantined animals may be treated by a veterinarian, but rabies vaccine should not be administered to the animal until the quarantine period is complete. At the end of the quarantine period the dog, cat, or ferret will be reexamined by a veterinarian. The results of the veterinary examinations will be documented and communicated to the Rabies Control Authority, the Public Health Official, and the owner.

2. If at the end of the quarantine period, the dog, cat, or ferret shows no signs of illness compatible with rabies, it may be released from quarantine with the approval of the Rabies Control Authority or the Public Health Official.
3. If at any time during quarantine or upon examination, the dog or cat shows signs of illness compatible with rabies, the animal shall be humanely euthanized and tested for rabies in an approved laboratory at the discretion of Rabies Control Authority or the Public Health Official after conferring with the examining veterinarian.

#### B. Dogs, Cats, and Ferrets that are Not Currently Vaccinated Against Rabies

1. A dog, cat, or ferret that is not currently vaccinated against rabies, that bites or reportedly bites a human will be considered a rabies suspect and will be seized by the Rabies Control Authority and quarantined under such conditions as are outlined in an official quarantine order issued by the Rabies Control Authority or Public Health Official. The quarantine shall be conducted under the supervision of a veterinarian, for a period of not less than 10 days from the date of the bite. Instead of being quarantined, the animal may be humanely euthanized and tested for rabies in an approved laboratory. Quarantined animals may be treated by a veterinarian, but rabies vaccine should not be administered to the animal until the quarantine period is complete.

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2. The rabies suspect dog, cat, or ferret will be examined by a licensed veterinarian at the beginning and at the end of the quarantine period, to determine its health status. The results of the examination will be recorded and communicated to the Rabies Control Authority, the Public Health Official, and the owner.
3. If at any point during the quarantine period or upon examination, the dog, cat, or ferret shows signs of illness compatible with rabies, the Rabies Control Authority or the Public Health Official will order the immediate humane euthanasia and rabies testing of the quarantined animal in an approved laboratory after conferring with the examining veterinarian.
4. If at the end of the quarantine period the dog, cat, or ferret shows no signs of illness compatible with rabies, it may be released from quarantine with the approval of the Rabies Control Authority or the Public Health Official. Prior to its release, the dog, cat, or ferret will be vaccinated against rabies at the owner's expense. Alternatively, the dog, cat, or ferret will be vaccinated within 72 hours of release. The owner will pay to the Rabies Control Authority a prescribed rabies vaccination deposit that will be reimbursed upon the presentation of proof of rabies vaccination by a private veterinarian.

### C. Other Animals

1. Animals, other than dogs, cats, or ferrets, that bite or reportedly bite a human will, at the discretion of the Public Health Official, be treated according to the circumstances of exposure, the species, and the presence of rabies in the area. The pathogenesis and length of incubation and virus shedding periods of rabies in those other animals is unknown.
2. The animal may at the discretion of the Public Health Official, be seized by the Rabies Control Authority and immediately euthanized for rabies testing in an approved laboratory. Reports of the laboratory test will be provided to the Rabies Control Authority, the Public Health Official, the bite victim and the submitting veterinarian.

## Section VI - Animals that are Bitten by or Potentially Exposed to Rabid or Suspect Rabid Animals

### A. Dogs, Cats, or Ferrets Currently Vaccinated Against Rabies

1. A currently vaccinated dog, cat, or ferret that is bitten by, or otherwise potentially exposed to a rabid or suspect rabid animal will be revaccinated immediately and placed in isolation under observation for 45 days or euthanized.

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2. At the end of the isolation period, the dog, cat, or ferret will be examined by a veterinarian who will report the results of the examination to the Rabies Control Authority or Public Health Official.
  3. If the examination determines that the dog, cat, or ferret is free of signs of illness compatible with rabies, it may be released from isolation with the approval of the Rabies Control Authority or the Public Health Official.
  4. If at any point during the isolation period or upon examination, the dog, cat or ferret shows signs of illness compatible with rabies, the Rabies Control Authority or the Public Health Official will order the immediate humane euthanasia and rabies testing in an approved laboratory of the animal after conferring with the examining veterinarian.
- B. Dogs, Cats, or Ferrets that are Unvaccinated or Not Currently Vaccinated Against Rabies.
1. A dog, cat, or ferret that is not currently vaccinated against rabies and is bitten by or otherwise potentially exposed to a rabid or suspect rabid animal shall be euthanized immediately.
  2. If the owner is unwilling to consent to euthanasia, the animal must be quarantined for a period of not less than six months. It shall be seized by the Rabies Control Authority and impounded at the owner's expense for six months in strict isolation, under such conditions as are outlined in an official isolation order issued by the Rabies Control Authority. The animal will be vaccinated against rabies upon entry into quarantine or one month prior to release.
  3. At the end of the six- month impoundment, the dog, cat, or ferret will be examined by a licensed veterinarian who will report the results of the examination to the Rabies Control Authority or Public Health Official.
  4. If the examination determines that the dog or cat is free of signs of illness compatible with rabies, it may be released from impoundment with the approval of the Public Health Official.
  5. If at any point during the impoundment period or upon examination, the dog, cat or ferret shows signs of illness compatible with rabies, the Rabies Control Authority or the Public Health Official will order the immediate humane euthanasia and testing of the impounded animal after conferring with the examining veterinarian.
- C. Livestock
1. Currently vaccinated livestock bitten by or otherwise potentially exposed to rabid or suspect rabid animal will be revaccinated immediately and isolated under observation for 45 days or be euthanized.



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2. Unvaccinated livestock should be slaughtered immediately. If the owner is unwilling to have this done, the animal will be kept in strict isolation for six months under such conditions as are outlined in an official isolation order issued by the Rabies Control Authority.

### D. Other Animals

Any animal, other than a dog, cat, ferret, or livestock that is bitten by or otherwise potentially exposed to a rabid or suspect rabid animal should be euthanized immediately. Animals maintained in USDA-licensed research facilities or accredited zoological parks that are exposed or potentially exposed to rabies shall be evaluated on a case-by-case basis by the Rabies Control Authority or the Public Health Official.

### E. Testing of Suspect Rabid Animals

If a suspect rabid animal is available for testing, an animal that was bitten by or otherwise potentially exposed to the suspect rabid animal will be isolated pending the rabies testing result on the suspect animal. If the testing results are negative, the bitten or otherwise potentially exposed animal shall be released with the approval of the Rabies Control Authority or Public Health Official.

## Section VII - Impoundment of Animals found in violation of this code.

- A. The Rabies Control Authority shall operate a shelter or shelters, or the Rabies Control Authority may enter into a cooperative agreement with a licensed veterinarian or other organization for the establishment and operation of a quarantine facility.
- B. Any animal that is found off the owner's premises running at large or without a valid rabies vaccination tag shall be impounded. All impounded animals shall be given proper care and maintenance.
- C. Notice of impoundment of all animals, including any significant identification marks, shall be posted at the shelter as public notification of impoundment.
- D. An owner may reclaim a vaccinated animal that is impounded for lack of a rabies vaccination tag by furnishing proof of rabies vaccination and paying all impoundment and licensing fees prior to release.
- E. An owner may reclaim an unvaccinated animal during the period of impoundment by paying the prescribed shelter and rabies vaccination fees of \$ \_\_\_\_\_. A rabies vaccination must be administered prior to or within 72 hours of release. If rabies vaccination is not performed prior to or at the time of release, arrangements will be made by the local government to reimburse the rabies vaccination fee to a veterinarian designated by the owner after receipt of proof of vaccination.

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### Section VII - Penalties for Violation of Ordinance

Any animal owner who fails to comply with any of the provisions of this ordinance shall be guilty of an infraction and subject to a fine of not less than \$ \_\_\_\_ nor more than \$ \_\_\_\_.

### Section VIII - Shelter Fees

Impoundment fees shall be paid by the owner.

### Section IX - Enforcement

It shall be the responsibility of the \_\_\_\_\_ to administer this ordinance, and to promulgate the necessary rules and regulations for its implementation. Enforcement shall be the responsibility of \_\_\_\_\_

Effective \_\_\_\_\_ in the (city, town, village, or county) of \_\_\_\_\_ all regulations pertaining to rabies control (and licensing) will be enforced by the (local, county, or state) enforcement officers, or others with regulatory authority specified by the governing unit.

### Explanatory Notes

Communities that require licensure of dogs or cats may insert the following sections in the model ordinance:

#### Licensing

Effective (date) \_\_\_\_\_ in the (city, town, village, or county) of \_\_\_\_\_ every dog or cat 4 months of age and older shall be licensed. On proof of rabies vaccination in accordance with Section II of this ordinance, and upon application for licensure and payment of the required fee to the clerk (city, town, village, or county) of \_\_\_\_\_, a license shall be issued.

All licenses will expire \_\_\_\_\_, and each year thereafter.

#### Fees

The license fees shall be as follows:

- Male (sexually intact)
- Male (neutered)
- Female (sexually intact)
- Female (neutered)

NOTE: Rabies vaccinations may be recommended for animals other than dogs, cats, and ferrets for which a USDA licensed vaccine is available; however a current vaccination history may not eliminate the need for euthanasia and rabies testing if the animal bites a human.

## ANIMAL RABIES DATA FOR MAINE

Data on animals testing positive for rabies must be used with caution, as only animals that potentially expose humans, pets or livestock are tested. If a county does not have any animals that tested positive for rabies, this does NOT mean rabies is not present in that county. Positive animal rabies numbers by species for each Maine county from 1994 to 2005 are available at <http://www.maine.gov/dhhs/etl/rabies/rabies.htm>.

**Numbers of Animals Testing Positive for Rabies by Year and Species, 1994-2004**

	Raccoon	Skunk	Fox	Bat	Fisher	Wood chuck	Beaver	Bobcat	Coyote	Cat	Dog	Horse	Cow	TOTAL
<b>1994</b>	0	1	6	3	0	0	0	0	0	0	0	0	0	<b>10</b>
<b>1995</b>	41	44	7	8	0	0	0	0	0	0	1	0	0	<b>101</b>
<b>1996</b>	53	48	15	9	1	0	0	0	0	4	0	1	0	<b>131</b>
<b>1997</b>	130	61	32	9	0	7	0	0	0	4	0	1	0	<b>244</b>
<b>1998</b>	143	63	26	6	0	2	1	0	0	4	3	0	0	<b>248</b>
<b>1999</b>	116	72	4	7	0	1	0	0	0	7	0	1	0	<b>208</b>
<b>2000</b>	73	47	9	5	0	1	0	2	2	0	0	0	0	<b>139</b>
<b>2001</b>	34	32	5	8	0	0	0	1	0	3	0	1	1	<b>85</b>
<b>2002</b>	37	19	5	6	0	0	0	0	0	0	0	0	0	<b>67</b>
<b>2003</b>	38	25	5	9	0	2	0	1	0	0	1	1	0	<b>82</b>
<b>2004</b>	26	29	4	7	0	2	0	0	0	1	0	0	0	<b>69</b>